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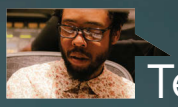

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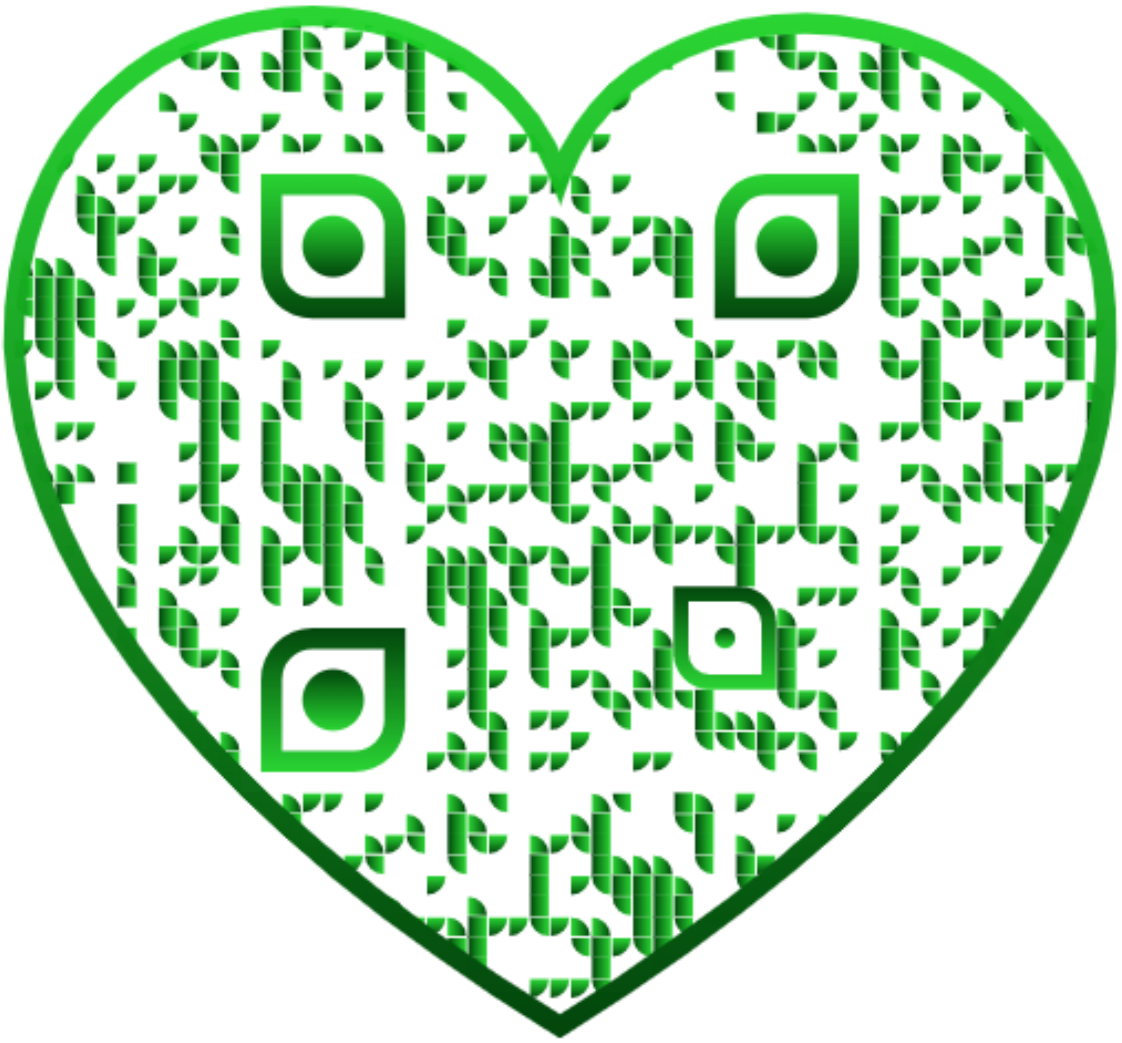

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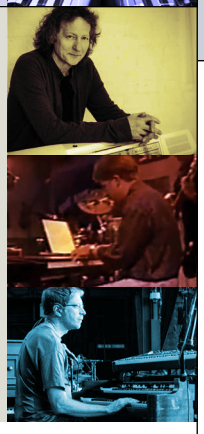

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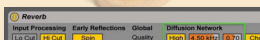

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COVER PHOTO: LAURA CHRISTIE

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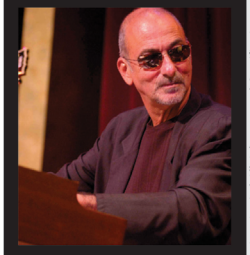

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BRIAN DIESCHER

On June 24th, the world lost another innovative musician, one whose five decades of work influenced generations of listeners across a wide range of styles—from funk and rock to reggae and pop. George Bernard "Bernie" Worrell Jr. was 72.

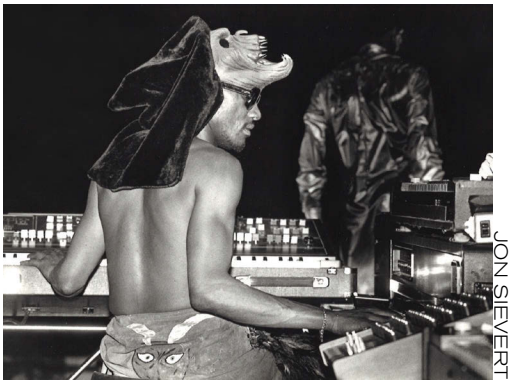
Worrell was a classically trained child prodigy with perfect pitch, and his musical interests and experience ran deeper than listeners could imagine. "My sense of orchestration comes from playing Bach fugues," he told us in his February 2000 interview. "You get a sense of color and textures when you study classical music." He used his impressive orchestrational skills for horn and string arrangements as well as keyboard and synth layering, not to mention balancing groove elements. And whether laying down a bass line, melody, or comping, man, did he have *feel*!

As he was the first to admit, the Wizard of Woo was all about defying expectations. He could never be satisfied playing the exact same thing night after night. Worrell yearned for the unexpected, and it was by veering away from the obvious that he became an innovator in both his playing style and sound palette.

As Worrell courageously battled cancer this year, he kept active as best he could. Unfortunately, we were caught off guard by his passing and this month's issue was too far along in the production cycle to create a fitting tribute. Therefore, we have a joyous look at his life and career planned for our October issue.

In the meantime, we've posted four interviews with Worrell at keyboardmag.com for you to enjoy. The first dates back to August 1978 when we were still *Contemporary Keyboard*. Next, we caught up with him in November 1985 after his work with the Talking Heads, followed by a Master Class, "Back to the Woo," in 2000. In November 2007, he was our feature interview.

Gino Robair
Editor in Chief

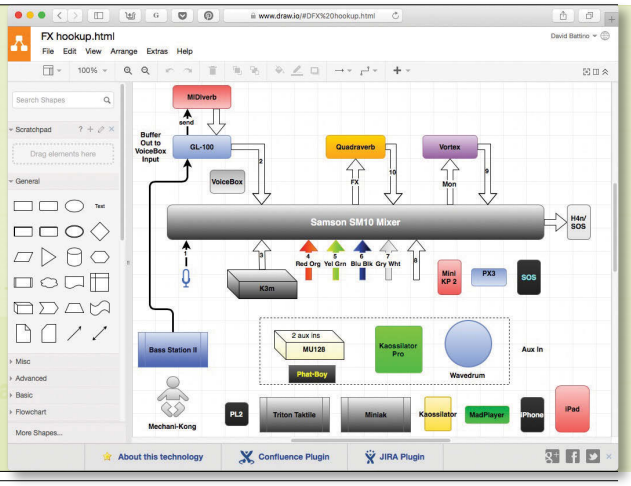


JON SIEVERT

Key Secrets

Go For the Flow

Years ago, I sold my noisy line mixer and switched to soft synths for music production. (I still play hardware live.) However, I kept thinking it would be cool to bring my hardware synths and effects back into the game. Enter the **Samson SM10** ($199 street), a quiet, single-space rack mixer with eight stereo inputs and two stereo effects returns. Combined with the aux inputs on my synths, I could hook up a ton of gear. To plan it out, I used **draw.io** (http://draw.io), a free online flowchart app. (Draw.io is a terrific way to plan live rigs as well.) For modular synth enthusiasts, **Modulargrid.net** offers an even slicker approach to planning your rack. It can document your patches, too. David Battino



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NEW GEAR

BY GINO ROBAIR

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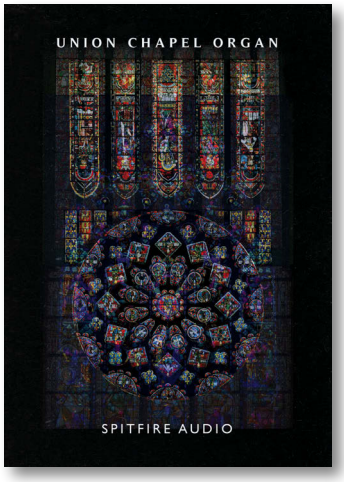
WHAT A 2-channel USB audio/MIDI interface with Lightning and 30-pin connectors for use with iOS devices, balanced stereo outputs, and zero-latency direct monitoring. Comes bundled with Cubase LE (Mac/Win/iOS). **WHY** An affordable way to record audio and integrate it with your computer or iOS instruments and DAWs. **$159 street | tascam.com**

WAVES ELECTRIC 88

WHAT Sample-based virtual instrument (standalone and plug-in) of a "road worn" 88-key Fender Rhodes Mark I. Includes effects (drive, compression, reverb, chorus, phaser, panning and tremolo) as well as amp simulations and mic options. **WHY** When you need a '70s-era EP that offers all the nonlinearities of the real instrument. **$69 | waves.com**

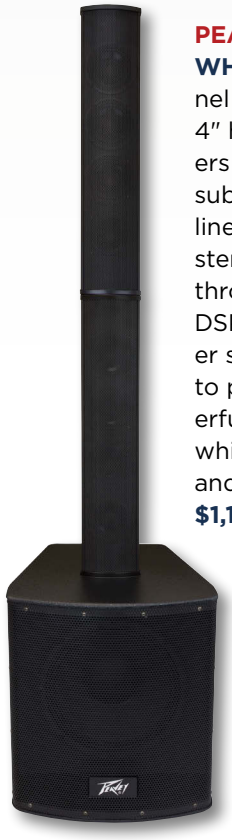


SPITFIRE UNION CHAPEL ORGAN

WHAT An 11.9 GB sample-based virtual instrument of a 19th century pipe organ from London, England. Includes a variety of stops for keyboards and pedals, with 2′ to 16′ pipes. Requires full version of Kontakt 5. **WHY** With four different mic setups to choose from, you get a wide variety of tonal options from this pipe organ library. **$229 | spitfireaudio.com**

DAVE SMITH INSTRUMENTS OB-6 DESKTOP MODEL

WHAT A 6-voice, fully analog synthesizer based on the original Oberheim SEM module, but with digital effects and control capabilities. Includes Polychain feature to hook up two OB-6s and achieve 12-voice polyphony. **WHY** When you want a gigantic analog-polysynth sound, but you don't need another keyboard instrument. **$2,299 street | davesmithinstruments.com**



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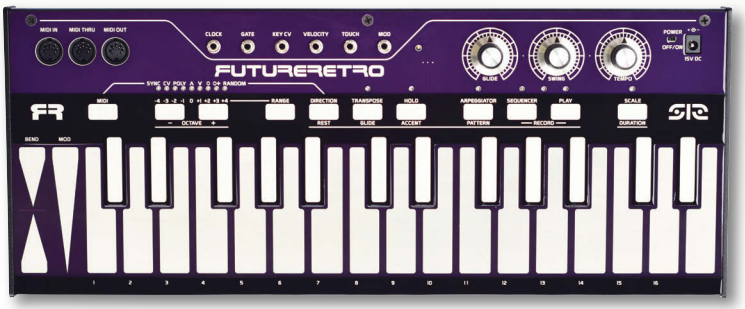
WHAT Limited edition versions of Arturia's analog monosynths that provide patchable connectivity, a Steiner-Parker multimode filter, a suboscillator and, on the MiniBrute, MIDI and USB connectivity. **WHY** Sometimes you want your synth to physically stand out in your onstage setup or in the studio. Perfect for the Kraftwerk cover band! **$399/$299 | arturia.com**

REMIC P6000 STEREO PIANO MIC

WHAT A stereo condenser microphone designed for recording grand pianos. Featuring a matched pair of high-definition mic capsules, the P6000 is placed under the strings, directly on the soundboard, and pointing toward the hammers. **WHY** Designed for high-resolution classical recording, the mic boasts excellent transient response and no audible phase issues or low-frequency pitch distortion. **$7,500 | remic.dk**



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WHAT Polyphonic, capacitive touch-controller keyboard with MIDI ports and CV/gate outputs for use with analog modules. Includes an arpeggiator, sequencer, MIDI-to-CV converter, mod wheel, pitch bend, velocity, Aftertouch, and much more. **WHY** Combines classic capacitive-touch capabilities with modern control and connectivity for use with all of your synths. **$800 street | future-retro.com**

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STUDENTS LEARN REAL-WORLD SKILLS BY HELPING DESIGN ACOUSTIC PIANOS

BY GINO ROBAIR

"I SEE YOUNG PEOPLE COMING UP THROUGH THE EDUCATION SYSTEM AND going through the STEM programs. But a lot of times, a public school's idea of what a STEM project is falls short from reality," says Mark Perry, program developer and partner in DraftEngine.org, which teaches students in Central Virginia "about all of the uses of creativity."

The program was launched three years ago to provide STEM (Science, Technology, Engineering, Mathematics) education to students from the Appomattox Christian Academy (ACA). Perry partnered with another instructor at the ACA, Chad Houk, to not only teach AutoCAD but to offer a richer experience. In the last two years, that has included designing and building pianos.

"I've been rebuilding pianos my whole life and applying my engineering experience to my work," Perry explains. "Our STEM-based curriculum teaches them how to use drafting software to draw what we will build. By drafting it, then taking that interpretation into machining and then assembly, the students go from one stage to the next so that, by the time they graduate high school, they have learned good engineering practices, how to analyze finite elements and composite aerospace materials, as well as traditional woodworking skills."

The students can take part throughout their four years of high school, and in some cases longer. "Students who show an interest in drafting are coming in at middle-school age. We also have some kids from the community that either go to public schools or are home schooled who get involved as we make connections."

The technology behind the instruments includes composite materials that make the pianos lighter as well as stronger. "The type of pianos we build are art-case instruments: They're hand-painted; there is a lot of hand carving; there is gilding. The frame has to be able to hold the stresses of the instrument, and the plate that we're building for the piano has to do the same. It's a marriage between dissimilar materials—the metals in the plate, the carbon fibers in the frame, the wood in the frame. Everything comes together in how we do it: That is one of the best forms of training for the aerospace industry."

Currently the program has two pianos in progress. "We're working on a shortened, chopped, lowered school bus that will have the piano built into it. The top will lift off, the side will lower: It will be like a parade vehicle. That's a partnership with a hot-rod enthusiast who has agreed to help us, and we're hoping that will blossom into a little bit of automotive technology. The practice of applied STEM technology remains constant in the program." The other piano is a semi-concert-grand in French curly walnut called the St. Andrew Edition. "It's going to have inlaid brass and a lot of hand carving. We have to find a foundry that casts brass and the kids will have some exposure to that."

Perry notes that the program is focused on skill development, not a finished product. "We're not promising a completed piano at the end. But they do get exposed to the majority of the actual work. There are over 20,000 moving parts and many components to build in a piano. By the end of the program, they have learned a wide variety of design skills.

"We'd like to be at a point someday where we build pianos with fantastic technology," Perry adds. "I want to build an invisible piano at some point. It is actually possible. Now, whether it's practical I'm not really sure." [*Laughs.*]

For more information about the program, or to make a donation to the organization, visit draftengine.org. ♫

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LAURA CHRISTIE

BY STEPHEN FORTNER

DAVE SMITH

THE SYNTH DESIGN ICON TALKS ANALOG, MIDI, AND MORE

WHEN IT COMES TO HOW KEYBOARD PLAYERS MAKE MUSIC, DAVE SMITH MAY be the most influential person alive. His early experiments building sequencers led to his first company, Sequential Circuits, releasing the first programmable polyphonic slab synth, the Prophet-5. His work on wavetable and vector synthesis in the Prophet-VS was reborn in the enduring Korg Wavestation. His Seer Systems Reality is widely acknowledged as the first commercially available "professional" soft synth. And though he tells the story more modestly, it's acceptable shorthand to say that he invented MIDI.

At the North Beach, San Francisco, offices of today's Dave Smith Instruments—which makes some of the most desired analog and hybrid synths on the market—we settled in for a long conversation with Dave about where he's been, where he sees the synth industry going, and what it's like to finally feel like a rock star. In fact, we covered so much ground that we could fit only part of it here—so be sure to read the "extended remix" at keyboardmag.com/september2016.

What was your point of entry into engineering before you were a synth designer?

When I got out of high school it was a time where if you didn't go to college you went to Vietnam. It was kind of a default to go into engineering. I always had kind of a technical interest. I started at Santa Clara, then I went to UC Santa Barbara for a year, and the last two years were at [UC] Berkeley. I had a day job as an engineer for about six years until I quit. I started Sequential

SIBYL HEISHMAN

Dave Smith during the heyday of Sequential Circuits, ca. 1979

Circuits after the first three years. I realized I didn't want to work in "regular" engineering the rest of my life, and that's when I got interested in synthesizers—when I bought my first Minimoog in, I think, 1972.

Your first product was a sequencer, correct?

Yeah. It was an analog sequencer—16 steps by three rows, a bunch of knobs, kind of the style everybody's building again these days. I wanted a sequencer to go with the Minimoog and the Moog ones were too expensive. So I just built it for my own use. Then I realized, maybe other people might want to have one, too. Sequential sold a grand total of four! That was 1974-ish.

What was the path that led from there to the Prophet-5?

It wasn't as direct a path as you might think. The main idea was programmability. I found out that there was going to be a set of integrated circuits from Solid State Music that did synthesizer functions. I'd been working on microprocessors in Silicon Valley for a few years and this was still early in the game, but I knew how they worked. So it was obvious to me that if you put a bunch of these synthesizer chips on a board with a microprocessor, you could build a fully programmable polyphonic synth. For a while I said, "I don't want to build a keyboard. Moog and ARP are going to do it." Then in 1977, two things happened. One, I finally quit my day job. Two, I thought maybe nobody is going to build this thing after all, so I'm going to do it. I started in probably spring of '77 working on what turned out to be the Prophet-5 and had it available to demonstrate at NAMM the following January. I basically did everything—the metal, the wood, the circuit board, the schematics, all the software, just the whole thing.

Today, musicians tend to see you, Tom Oberheim, Alan Pearlman, Roger Linn, and the memory of Bob Moog as one big happy family. Back in the day, though, what was the competition like?

We were lucky that the Prophet-5 had over a year with no competition because it took everybody by surprise. Oberheim was the fastest to respond with the OB-X, in 1979. Basically, after a year-and-a-half, everybody was either an Oberheim guy or a Prophet guy. It wasn't until the early '80s when the Jupiter-8 and Memorymoog came out that the market got more crowded with polysynths. What's really cool now is, fast-forward to 2016 and people have the same choice! They can buy a Prophet-6 or an OB-6. It was surprising being at NAMM and seeing how many people just immediately gravitated toward one or the other. It's like it's 1979!

You were the principal developer of MIDI. Before that, brands had proprietary interfaces but their gear couldn't talk to other brands. What was the tipping point?

The synthesizer market was tiny in the late '70s. No one was selling 50,000 of these things. It wasn't until the Yamaha DX7 came out that a company shipped 100,000-plus synths. But the Prophet-5 was the first synth with the microprocessor so when everybody started copying it, they used microprocessors. As soon as you have one in an instrument, you realize it's pretty easy for them to talk to each other digitally. It was around 1981 that we all started realizing the interface needed to be common. It wasn't like any one person had a bright idea. I remember talking to Tom Oberheim and he had talked to [Roland founder] Kakehashi about it. That was when I gave a talk at the AES convention in New York presenting the USI—Universal Synthesizer Interface. I get tagged as "the person who started MIDI" because I just initiated all of that. I followed up three months later at NAMM. I'm pretty sure it was Roland, Korg, Yamaha, and Kawai who all said "Let's do it." That was the start of what became MIDI.

Was there a business case made that someone who owns synth brand X might also buy brand Y if the two can talk to each other?

I don't remember it being quite that market-driven. Kakehashi was an engineer and a product guy, just like me. The same goes for Bob, Tom, Roger—everything was driven by someone where, it was *their* company. I think that's what's gone missing as things have become more corporate. The work was mostly done by Roland and Sequential. We were the only non-Japanese company so we wrote the spec and handled the English-language side of things. Yamaha, Korg, and Kawai came onboard, and I knew then that it was going to work.

You also came up with the name "MIDI"?

I remember a meeting where Kakehashi visited Sequential in San Jose and Jim Mothersbaugh [of Roland] was with him. They wanted to talk about the name. We all decided USI wasn't good. So they'd suggested Universal Musical Instrument Interface, pronounced "you-me," as in "we all connect together." I thought it sounded a little corny, but I liked the idea of musical instrument instead of just synthesizer. For some reason "Musical Instrument Digital Interface" popped in my head and I said, "How about MIDI?" Everybody said, "Okay."

The original promise of analog synthesis was to create any sound by getting under its hood, so to speak. Starting in the '80s, there was the idea that digital was better. Were digital Sequential synths like the Prophet-VS part of that narrative?

The Prophet-VS was kind of in between—hybrid digital oscillators and analog filters with the whole vector synthesis thing. It wasn't an attempt to "be more digital." That was what we were doing with samplers like the Prophet 2000. [The VS] was more that a couple of guys came up with the idea of this four-way envelope-modulat-

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ed vector synthesis idea, controlled by a joystick. We all just said, "Hey, that sounds like fun." I've said this many times before, but to me, one of the reasons the Prophet-5 was so successful is, it was the first time people could actually have an *emulative* instrument on which they could play brass and strings and organ, some electric piano-like sounds, flutes . . . Of course, we would've sold ten times more if it was $1,000 instead of $5,000. One of the main reasons the DX7 did so well is, it was $2,000, it had 16 voices, it had velocity, but it was a better emulative instrument. That Rhodes sound was, like, 90 percent of it!

Was that the beginning of analog's long slumber?

The real death blow was when the Korg M1 came out, which was by far the most popular keyboard ever made. It even outsold the DX7. Finally, here was what keyboard players always wanted—real piano, brass, strings, organs, basses, leads. This is somewhat unfair and I'll say why, but it put synthesis innovation into a 20-year dark ages, because ever since the M1 every company just kept building M1s. More voices, more and better sounds, more precision—just more, more, more.

In some ways, they're still doing it. So why was that unfair to say?

Because it's what 90 percent of keyboard players need to play gigs, which is different from players who are into *synths* for their own sake. What's cool and different now is people are once again playing synths *as* synths because they've already got their Nords and Motifs and so forth to cover all the other sounds they need. So if you buy a synth now, it's because you actually want to play a synth. That's why I think this time it's going to be different from last time. There's not going to be something digital that comes in and makes true synthesizers go away again.

Fast-forward a few years. A lot of people credit Seer Systems Reality as the first soft synth. What was the impetus for your getting into software?

Well, whenever you talk *firsts*, there's always somebody earlier. They were in a university, or they built one and nobody knew about it, or they sold 20 of them, whatever. But at Seer we did three generations of soft synths. The first one was for Intel. Intel was just starting the idea of native signal processing actually being able to do real stuff on a computer, and Andy Grove even used it for demos at Comdex. The second generation, we licensed to Creative Labs to put in one of their sound cards—this was mainly sample-based with General MIDI. A million of those things shipped. But what we'll call the first real professional soft synth was Reality. It had sampling, it had subtractive, it had FM, it had modeling—all of this in one soft synth.

So we called it the future of music synthesis and to a degree, we were correct. But the first time we showed it at NAMM, people would come in and we'd have a keyboard connected to it and they'd go, "What do you mean, software synth?" "We've got this PC here. It's running software that actually *is* the synthesizer." "I don't understand." It was one of those cases where you're too early to the marketplace.

Would you share the story of Sequential selling its name to Yamaha, and you getting the name back in 2015?

One of the biggest mistakes we made at Sequential was that we tried to get into the computer market in around 1984. We were also trying to build lower-cost instruments. We should've stayed with pro instruments and probably would've done fine. Out of the blue Yamaha came in and asked, "We want to work with you guys somehow." And I said, "If you do, you'd better do it quickly because we may not be around in six months." They actually moved very quickly and bought the company in such a way that nobody made any money on it but it kept it from going belly-up at the time. Over the next year-and-a-half, they never could quite decide what to do with it. I think we kind of got caught in between Japan and Yamaha US. Ultimately, they just shut it down. And of course they owned all the names.

That's when I went over and started with the Korg R&D group in San Jose, which is still there. The first product we did was the Wavestation. And after three or four years I kind of drifted away from that, then to Seer, then back to my own stuff. In hindsight, if we'd built a software Prophet-5 we would've been much more successful from the beginning. Instead, Native Instruments did.

It was kind of a surprise when I got a call from Yamaha asking if we wanted the Sequential name back. Apparently Kakehashi had sent a letter to the president of Yamaha, Takuya Nakata, asking him to give Dave his name back, and he very graciously agreed. That never happens anymore in the industry. Everybody's all about grabbing brands and intellectual property.

The M.I. industry is full of stories of small developers being bought by larger companies and running into trouble. Since DSI

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started, you've kept control of your brand. What do you think you've done differently?

I was in my mid-20s when I started Sequential and didn't really know what I was doing. Back then the attitude was more like, take over the world and see how much we can grow. This time around I purposely avoided that.

We can design things quickly because we have no sales reps or marketing department to have a bunch of meetings with. So our development cycle is, hey, let's build our first proto, a second proto to verify everything, and then start shipping. The OB-6 took us six months. Tom Oberheim and I talked in June and showed it in January.

There's another main difference. A lot of the bigger companies, when they come out with a new product, it's almost always replacing an old one. When we come out with a new product, it's a unique thing that adds to our product line. The Prophet '08 has been out for eight years already, almost nine, and we're still selling them steadily because it's different than a Prophet-6 and both are different from the 12. People pick up the synth that fits their needs and we just keep growing.

What are the main challenges in designing a good analog polysynth at a reasonable price?

Well, the Prophet-6 has more than 100 control voltages flying around, so we have high-speed processors generating control voltages at audio rates. We were able to do it at a reasonable price point. It's a tricky design. We know all of our competitors probably bought one last summer and opened it up. It actually started with the Poly Evolver—the idea of having a high-speed processor per voice to do everything efficiently, and that's of course what's in the Korg Minilogue. It has four voices, each one with a fast processor controlling it. This is to be expected once people figure out how to do things.

Where do you think the whole Eurorack craze is going to end up?

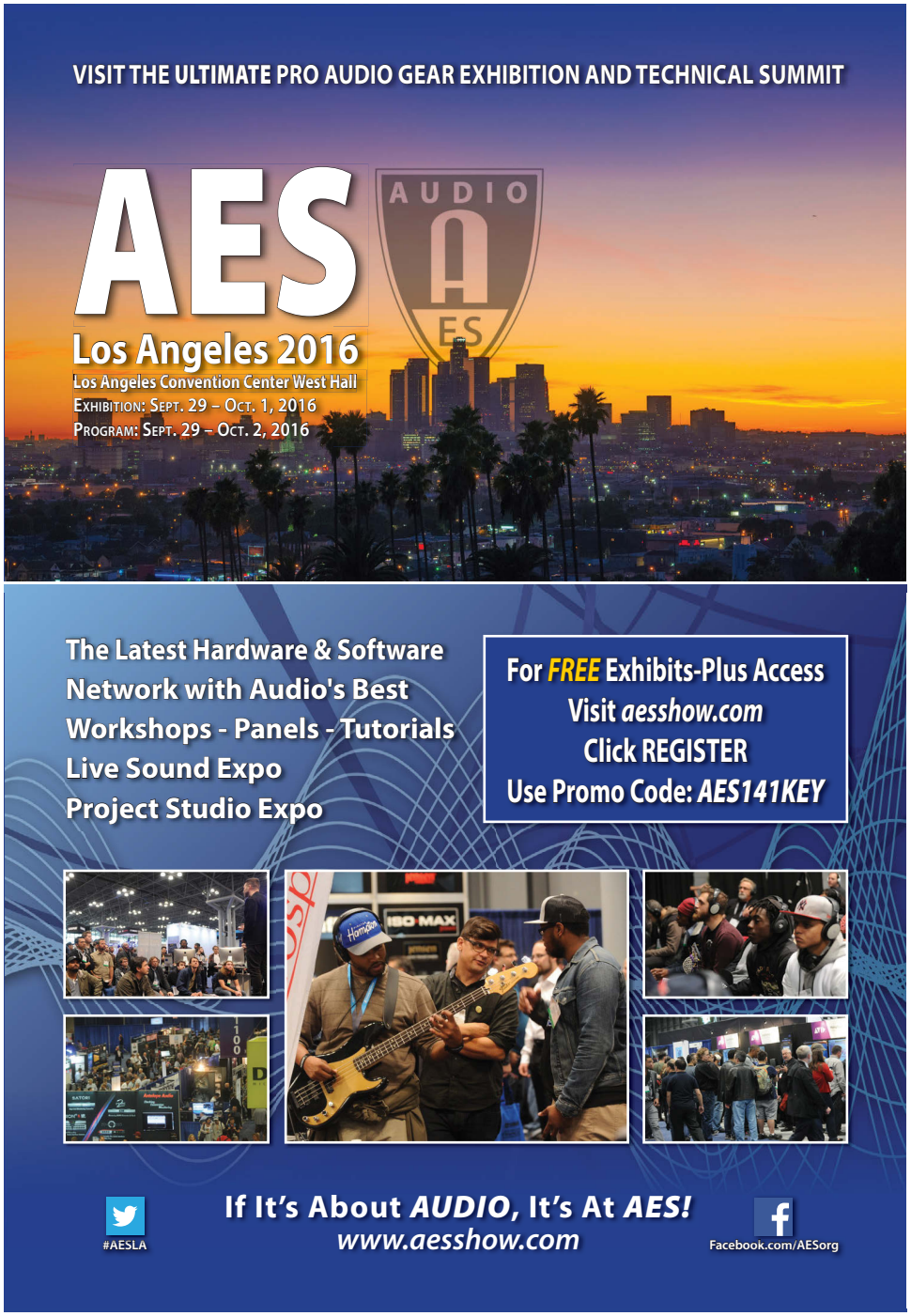
I refuse to predict, but I think it's awesome—the fact that people are getting into synthesizers, getting hooked on buying modules, and hopefully actually using the modules they buy to make cool new sounds. Personally, I like having a Save button in whatever instrument I'm working with. I'd put a Prophet 12 or Pro 2 up against most modular systems. Obviously it doesn't give you the advantage of adding some awesome wacko little module somebody built in their basement. I'd like to see more real music made with them, but that's difficult because any sound you get, you have to use it right then because you *won't* get it again! Of course, modulars look great. Having all those wires gives you that synth cred! But just philosophically, I prefer to build complete instruments.

MPE—Multiple Polyphonic Expression—is showing up in more and more controllers like Roger's LinnStrument, the Roli Seaboards, and Keith McMillen's stuff. Is this the future of playing the synthesizer, a solution in search of a problem, or something in between?

It's something in between. Roger just asked me very specifically about MPE. We have customer wish lists for all our products. MPE is something like that. We've had a handful of people request it. I told Roger if it gets to the point where a lot of people want it, we'll consider it. It's like alternate tunings. People have been bugging us for years about that—usually the same small group. We finally did implement it—I think the Prophet 12 was first. This gets back to our limited engineering time. Of course, people have been interested in alternate controllers for years—go back to the original Moog versus Buchla debates in the '60s!

The "east coast" vs. "west coast" schools of synth design?

Right. [East coast] has a keyboard because that's what most people want to play. [West coast] didn't because synthesizers should have a control-



ler that connects to their unique sound possibilities. Well, we know which one won the Darwinism battle. The main thing, though, is chicken-or-egg; getting enough people willing to spend the hours to develop the muscle memory to play your alternate controller, and they're not going to do that unless they're pretty much guaranteed that the thing is going to be around. I used to point to the Chapman Stick as an example. Here is this cool bass-guitar hybrid thing that Tony Levin played, but aside from a small group of enthusiasts it's not really in the musical instrument repertoire now.

What do you think of the prospects for alternate controllers in general?

Well, the Seaboard is better because it's keyboard-based. It's kind of like a black-and-white keyboard on steroids. Don't get me wrong—I really want to see things like the Seaboard and the LinnStrument take off. One of the first accessories I ever built for my Minimoog was a light-based controller, in fact. It's similar to what I've always said about the idea of MIDI 2.0: If you could get Yamaha, Korg, Roland, and maybe Nord to do it, game over. Everybody else would have to sign on, just like the first time around. But I also think that as-is, MIDI is good enough to do anything you need.

I've seen how your booth at NAMM is just mobbed. I've seen the adulation when 20-year-olds in an indie band recognize you. I've seen this happen to Tom and Roger. In the first heyday of synthesis, it didn't seem like the synth designer was a *personality*—except possibly Bob Moog. Now, you guys are treated like rock stars. Is that a new feeling?

A lot of it is about longevity and history. Bob started ten years before we did, and this is going to sound kind of silly but his name was simple to pronounce—even though most people mispronounced it! It became the Kleenex of synths. People looked at any synth and went, "Is that a Moog?" When I came out with the Prophet-5, I didn't have that history, and I was actually the only one that didn't use my name. Moog, ARP, Linn, Oberheim—pretty much everybody else did. So of course nobody knew who I was, even the second time. "Dave Smith Instruments, what's that? The Prophet guy? Oh, cool." Just like everybody loves old synths, they like the old synth designers, too!

It's funny you compare us to rock stars, because there's a big parallel between bands and synth designers. How many bands did something 20 or 30 years ago that was really cool and ever since, they've been trying to record new albums? Go to a show and they want to play the new stuff but the audience only wants to hear the old stuff. I get that even now. People come up to me at the booth and only want to talk about the Prophet-5, even as they're surrounded by new instruments. It's having to prove later in life that you can still be relevant, just like somebody in a band. Some bands like Radiohead or U2 do this successfully, but many still tour based on what they did 20 or more years ago.

So I think why we get treated like that now is because if we haven't so much *reinvented* ourselves, we've been able to reproduce what we did before with instruments that people actually like and use and that have modern convenience and stability. It's a good combination, and we also have the name recognition that comes from history, since the mindset in our industry is very "vintage." It shouldn't be, but I'll take it! ♫

Read our interview from November 1979, online: Dave Smith—The Designer of the Prophet Discusses Microprocessors and Programmability.

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TERRACE MARTIN

THE KEYBOARDIST AND PRODUCER ON HIS WORK WITH SNOOP DOGG, HERBIE HANCOCK, AND HIS NEW ALBUM *VELVET PORTRAITS*

JON REGEN

"I WAS LISTENING TO EITHER STRAIGHT-AHEAD JAZZ OR GANGSTA RAP," acclaimed multi-instrumentalist and producer Terrace Martin says of his formative years in South Central Los Angeles. "We grew up with a lot of challenges, but when you're young, you don't even realize things are challenges."

Somewhere between jazz and rap lies Martin's fearless brand of soul-infused, groove-centered music. He is seemingly *everywhere* of late, performing on the Grammy Awards with frequent collaborator and Hip-hop icon Kendrick Lamar, touring his own genre-defying project *Velvet Portraits*, and playing saxophone and keyboards with jazz icon Herbie Hancock, whose new album Martin is producing.

Just days before hitting the road for an overseas tour, Martin met me in a midtown Manhattan recording studio to talk about his continued quest for musical mastery.

You've been taking the musical world by force lately. Can you talk a little about your background?

I'm from the Crenshaw district in Los Angeles, California. I grew-up in a house of music—my father's a drummer, and my mother is a songwriter, vocalist and pianist. I grew-up in the 1990s, so rap and hip-hop were also huge influences on me. Gangsta rap was being born around the time I was coming-up, so that was also a big influence on me. I was around a lot of the musicians on the L.A. scene and I toured with Snoop Dogg for 12 years. He knew me since I was 16, and I toured with him playing keyboards and horns, along with [acclaimed Los Angeles musicians] Kamasi Washington and Thundercat. Eventually, I started producing things myself.

You were raised in the South Central area of Los Angeles. That must not have been an easy neighborhood to grow up in.

You know what? It wasn't easy, but at the same time we didn't know it was hard, if that makes sense. We had our trials and tribulations, but being from L.A. we were used to that. When I was growing up, there was a lot of gang violence going on—murders and drive-by shootings, so my parents made me stay in the house. And that's really where I got a lot of my musical influences from. I found my joy staying inside and listening to old records.

What was the first instrument you started playing?

My first instrument was a Technics 1200 turntable! My second instrument was an Ensoniq EPS sampler/workstation, and my third instrument was the saxophone. I started playing sax the summer going into high school. I was listening to my godfather, Harold Stemzy Hunter. He's from Omaha, Nebraska and played and arranged on a lot of Buddy Miles records. He also played bebop jazz, and he was my biggest influence along with Grover Washington Jr. and Richie Love. Then I discovered Cannonball Adderly, Charlie Parker, and later Jackie McLean, which changed my life.

How did your longtime association with Snoop Dogg come about?

That started because of my dear friend and production partner Marlon Williams. He had played guitar and worked on records with Snoop since the 1990s. I had told Marlon that if Snoop ever had an opening, I would *love* to be a part of his band. I told him I knew all of his music and could play whatever instruments they needed me to. Marlon told me that they had an opening in Snoop's band on keyboards. So I joined the band, and it was the best decision I ever made in my life.

At the same time you were working with Snoop Dogg, were you also working on your own music?

I was doing *everything*. When I was with Snoop, some days I was practicing my horn, or working on my own music, or going to the club learning different things. The one thing about touring with Snoop is that every day is a different musical experience. Music *drives* the whole tour. He's playing oldies like Parliament Funkadelic or John Coltrane—all of this beautiful, soulful music. You're hearing all of these things, and then you're also playing his music. So you're able to expand on all of it and do everything.

When I first heard your new album *Velvet Portraits* I thought "Los Angeles has a new musical language all its own." I think that song is a great snapshot of the new L.A. sound, mixing jazz, rap, Hip-hop, funk, and more.

The true story is, I had a whole other record called *Velvet Portraits* done, but I thought the hard drive had crashed! So I had to make another record, but I wanted to do something different. I like to start off every record with a *conversation* amongst the people that are being creative on the project. We talk about how they feel about love and the different topics I want the record to be about. We come up with ideas, and then the music is really a soundtrack for the conversation we had.

Did you choose the musicians for the album

PHOTO: SAMANTHA J

before the music was even written?

I've done all of my albums with the same cats—myself, Kamasi Washington, Stephen "Thundercat" Bruner, Robert Glasper, Ronald Bruner, Marlon Williams, Brandon Owens, and so on. I've used the same cats on all the records I've done since I was a kid. They're my friends. So what better way to paint a picture of me than by using people who know my story, my heart and my compassion? I wanted to make this portrait with people who understood how important it was. And they just so happened to be my brothers, my family.

How did the record get fleshed-out? Did you record it at home or in the studio?

I recorded 85 percent of the record at Make Believe Studios in Omaha, Nebraska. My father lives there, and at that time he had fallen ill for a brief time. He being one of my favorite musicians, I decided to fly out to Nebraska with the other musicians for a couple of weeks to record the album with my father playing drums close to where he lives. I wanted him to be comfortable, and at the same time, we would be isolated and focused on the music, with good food, good water, and sweet people around us.

What was the basic gear setup you used for the making of *Velvet Portraits*?

I was playing keyboards and saxophones. We had a Fender Rhodes 73, a Wurlitzer, a Hammond B-3 organ, an ARP Odyssey, a Hohner Clavinet, and Apple Logic with every softsynth you can name. We also had lots of pedals—a Mu-Tron Bi-Phase, chorus pedals, lots of amps, an old Ludwig drum set with Istanbul cymbals. We went to Pro Tools, with everything going through great microphones into API or Neve preamps. Later, I mixed the record at my studio in Los Angeles.

You seem just as comfortable making records with a keyboard and a laptop as you are with old school gear in a "legitimate" recording studio.

It's funny you say that because about ten years ago, I told myself I would start walking into studios with no equipment at all to try and make something happen. If I'm in a hotel room and I want to work on music, I usually just have a laptop, some softsynths and a keyboard. But if I'm in my studio, I like to have all of my keyboards and gear around me.

If you had to name five keyboards you use on every record you make, what would they be?

The Rhodes 73 I got from Snoop Dogg would be one of them. Also the Korg Kronos 61, Roland Jupiter-80, the Minimoog Voyager, and the Studio Electronics SE-1 and Omega8. I have so many keyboards that I use regularly, it's hard to choose five! I also use the Roland VP-550, the Korg MS-2000 and the Prophet-08.

One thing that is so fascinating about your new album is that each song is a completely different adventure. I remember hearing the song "Push" on Apple Beats 1 while I was on a treadmill at the gym. I thought to myself, "This is like the Brand New Heavies and Larry Young had a baby!"

[Laughs]. Exactly!

Talking about sonic adventures, you've recently been performing with and producing the new album by musical titan Herbie Hancock.

Man, that's crazy. Herbie Hancock, *way* before I met him, was my favorite musician. He broke down the door for the thing I feed my family off of, which is Hip-hop. He broke down the barriers, coming from the jazz scene and lending his services to the Hip-hop scene. It shows you that we are all one. Being able to work with him is a dream come true and a huge honor. In my head, I don't even deserve to work with him. I'm just there learning. Herbie *loves* technology. That's why his music sounds the way it does. He's inspired by young creators, not just in music, but in life. He knows about all of the new gadgets coming out: He teaches *me* about technology!

What's the strangest piece of gear he's used so far on the record you are working on together?

The other day Herbie took out a *keytar*. He played it like it was its own instrument. And it was killing! Just beautiful.

For a guy that can effortlessly switch between jazz sax, funk keys and Gangsta rap, what's next on your musical horizon?

I've got a few things going on at the moment, but the main thing is whatever is pushing for peace, prosperity, and the growth of love, that's what I'm going to support. Right now, I'm trying to listen for the music that comes from my body and my soul. Then I'll start producing records. ♫

Terrace Martin plays "For Ever With You"

Terrace Martin: "Down the Rhodes"

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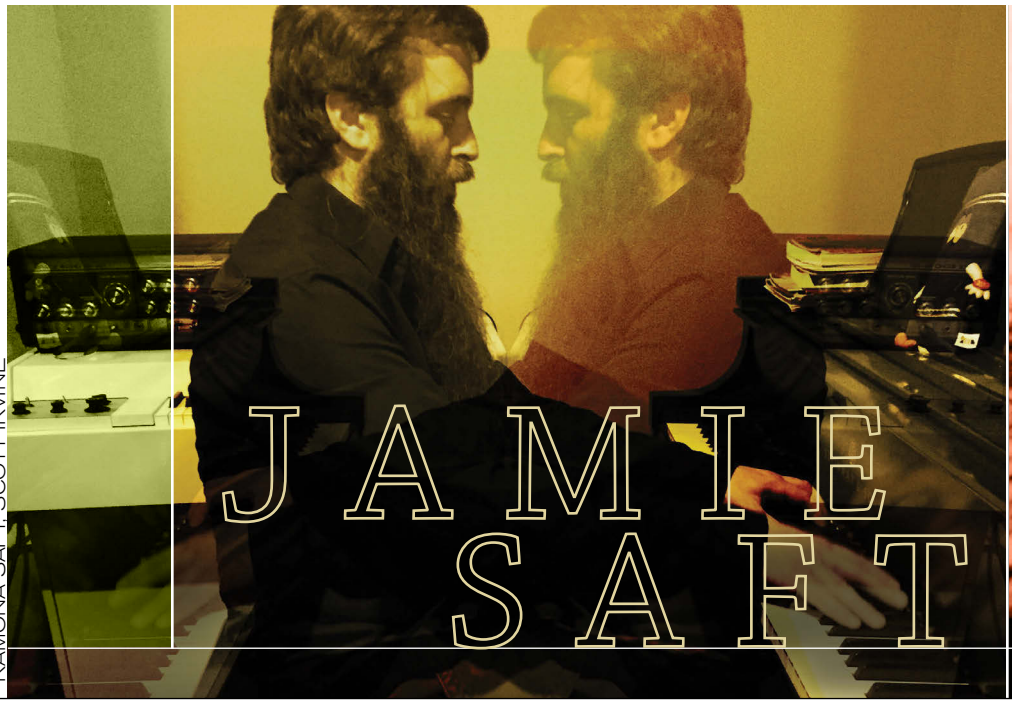

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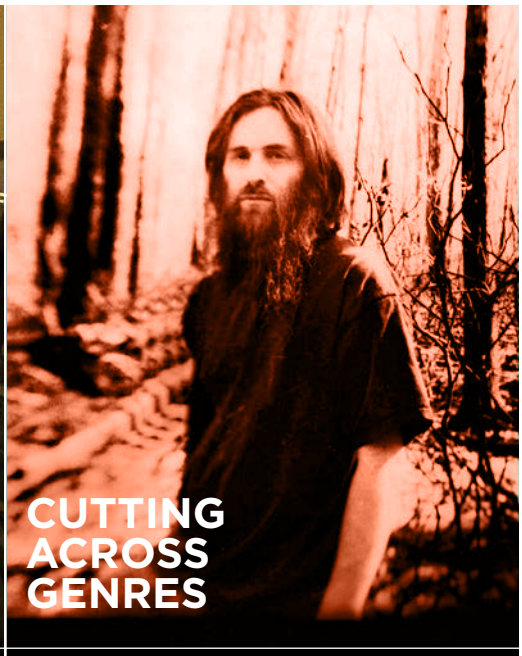
JAMIE SAFT



CUTTING ACROSS GENRES

JON REGEN

"I'M SO FORTUNATE TO HAVE WORKED WITH LEGENDS FROM ALL DIFFERENT kinds of music," keyboardist and composer Jamie Saft tells me from his studio in upstate New York. "Whether I'm playing with jazz masters like Steve Swallow or [hardcore punk band] the Bad Brains, I try to learn something every time."

Born in New York City, Saft studied piano from an early age. "Starting from the age of seven, I was lucky to have a strong technical background," he says. "I was trained classically as a pianist, and I was fortunate to work with Burton Hatheway, one of the great masters of technique. He taught the basic principles of physics as they applied to the piano. But early on, I realized that my ability to play music by ear went way beyond my reading skills. I got turned-on to people like [Thelonious] Monk, Miles [Davis] and [John] Coltrane when I was in high school. I thought Monk was the coolest thing I had ever heard, so I started gravitating away from classical music and more towards improvised music."

Saft later headed to Massachusetts to continue his musical studies. "I went to school at New England Conservatory and Tufts University in Boston, where I did their five-year double degree program," he continues. "It was there that I studied with many amazing music legends including Jimmy Giuffre, Cecil McBee, Joe Manieri, Geri Allen and Paul Bley. I got a jazz degree and moved to New York City in 1993. I was playing *all* sorts of things at that time. I've been interested in synthesizers, organ, Fender Rhodes, and all kinds of keyboards since I was a young kid. I got my first synth—a Roland Juno-106 when I was 13 years old, and I was always interested in synthesis, home recording, and computers. I really moved to New York with the idea that I wanted to play music with [saxophonist] John Zorn. I had become really obsessed with his band Naked City. That band just *exploded* the idea of genre, and showed me that all music was really one—that there were no boundaries—and that all types of music and styles could co-exist peacefully."

An introduction to John Zorn would come to Saft from a seemingly unlikely place—through *American Splendor* writer Harvey Pekar. "Harvey was an incredible jazz writer, and also a huge proponent of Joe Maneri, one of my greatest teachers," Saft explains. "He had called up Joe saying, 'What should I listen to?' Joe told him about a record I had made with the trumpeter Cuong Vu. And soon after, I got a call from Harvey Pekar saying, 'Joe Maneri tells me you have an amazing record. Can you FedEx it to me?' I said, 'Sure.' And the next day at around noon, the phone rang and my answering machine picked up. And it was John Zorn saying, 'Hey Jamie. This is John Zorn. Harvey Pekar tells me you have an amazing record. Can you FedEx it to me?' So suddenly my hero and someone I had dreamed of working with, was calling me. And that was the beginning of my working relationship with him, which has continued for 23 years."

Saft is immersed in myriad musical projects of late. "Over the last few years, I've been fortunate to be making records for a new label out of the UK called Rare Noise," he says. "We've done a bunch of records I'm particularly proud of, including a trio record with Steve Swallow on bass and Bobby Previte on drums. We did a record with legendary engineer Joe Ferla, going direct to analog 2-track here at my studio. That record did really well, and we just finished the follow-up to it. I also have a new record coming out with my New Zion Trio featuring special guest Cyro Baptista on percussion. For me, New Zion was an opportunity to combine some of the most important music of my life—reggae and dub with spiritual jazz of the 1970s from people like Alice Coltrane and Pharoah Sanders. It also taps into things like Kabbalah and trance-like, meditative states."

And what does Saft recommend to musicians hoping for a career as long and varied as his own? "Be open to any and all kinds of music," he replies. "I like being as inclusive as possible in music. There's always something amazing I haven't heard, and I'm always learning." ♫

Jamie Saft and the New Zion Trio with Cyro Baptista play "Mystics"

Jamie Saft and the New Standard Trio perform live

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TIPS & TECHNIQUES

From the Pros

1 Studio Monitors Placement

Placement of your studio monitors should form an equilateral triangle. The distance between each speaker should match the distance to your listening position. The high-frequency driver should be on axis with your ears. If your monitors are placed higher than your head, turn them upside down.

2 Use a Reference Track

Save yourself time and frustration by using a Reference Track when mixing. A reference track is a commercially mastered track that is similar to the track you are mixing. It's difficult for your brain to remember the relationship between Kicks and Bass, as well as other instruments. Start your mix session by listening to 60 seconds of your reference track to "reorient" your brain.

3 Take Breaks Often

It's important to give your ears and mind a break during long mixing sessions. Every 45 to 60 minutes, you should take a 10- to 15-minute break. Walk around, stretch, or grab a snack. After your break, remember to listen to your reference track for 60 seconds before getting back to work.

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The Art of Motion Piano

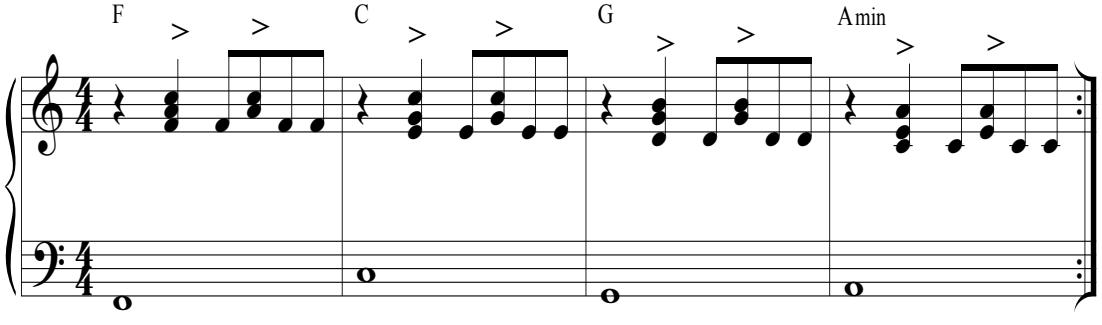
BY CLIFFORD CARTER

SANDRINE LEE

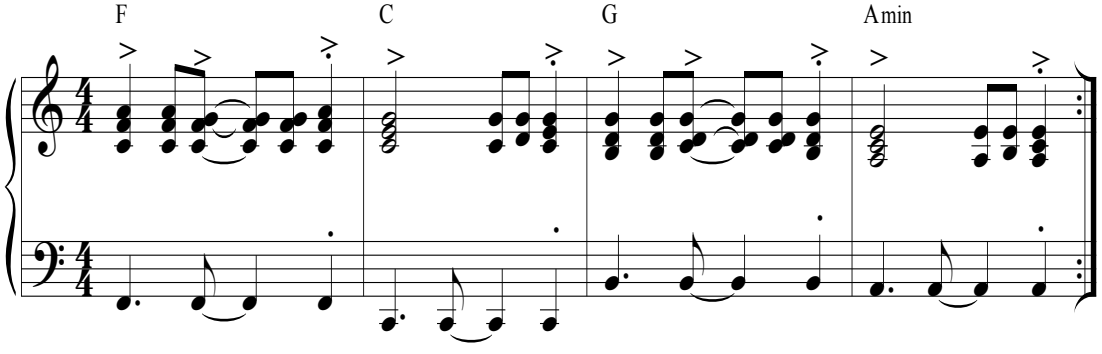
I RECENTLY BOUGHT A BABY MARTIN ACOUSTIC GUITAR ON A TOUR STOP IN Chicago. Learning guitar has reminded me that guitarists learn chords and strum the rhythms they *feel*. As a kid, I took years of classical piano lessons, reading music from a book. While this was a great foundation that I highly recommend, when I started playing pop music, I had to learn how to play chord progressions with the rhythms I feel.

The heart of pop music is its groove. So this month I'll discuss playing "rhythm piano" in a pop chord progression. The chords we will use are *F, C, G* and *A* minor (a *VI, I, V, vi* minor progression in the key of *C*). These four chords (in whatever order you choose) have been played countless times throughout the history of pop music. My goal this month is to play these chords in such a way that they give the track motion and feel, and here are five different ways to do just that.

Ex. 1



Ex. 2



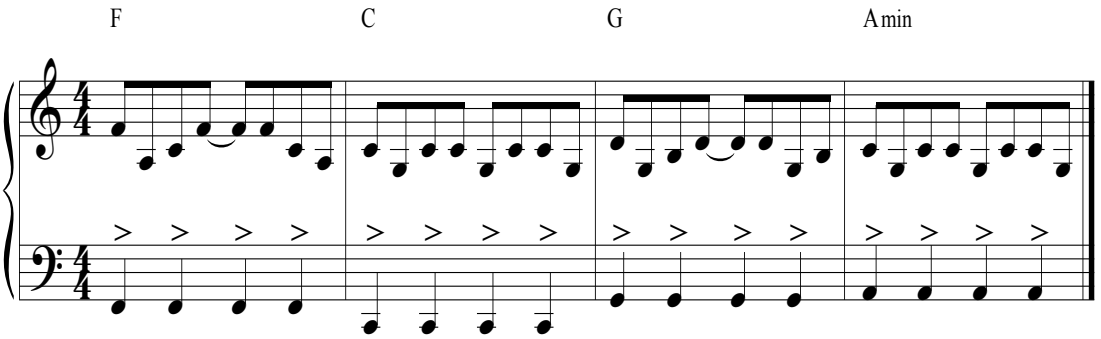
1. Rhythmic Figures with Eighth and Ghost Notes

Ex. 1 utilizes three main components to create motion in the piano part. First, there is a rest on beat one of each bar. Second, the right hand accents beat 2 and the "and" of beat 3, a tried-and-true comping rhythm often played on keyboards or guitar. And third, the use of single notes played on beat 3, beat 4, and the "and" of beat 4. I play these notes with my thumb: I use the thumb a lot to play ghost notes that fill space in between chordal accents. This gives forward motion and makes it sound like there is more then one part being played. The listener primarily hears the chords, but also feels the ghost-note rhythm.

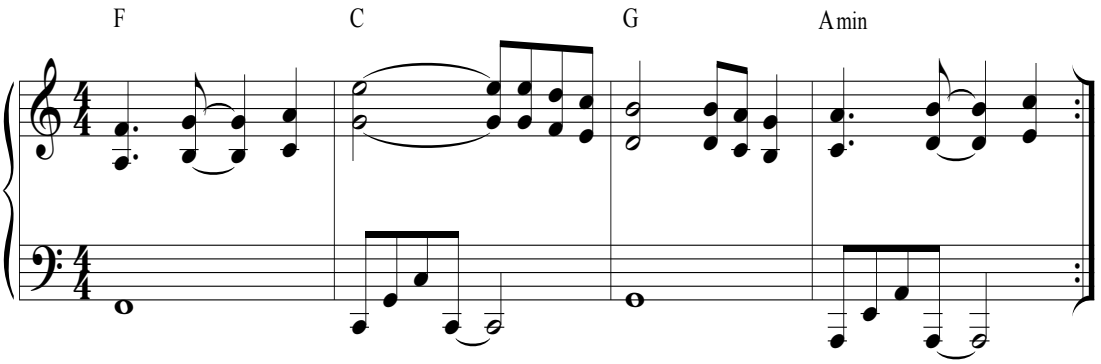
2. Non-Chordal Tones

The feel of this groove is defined by the use of syncopated eighth notes and notes other than the 1, 3, and 5 chord tones. In bars 1 and 3 of **Ex. 2**, both hands accent beat 1, the "and" of beat 2, and beat 4. In bars 2 and 4, the left hand accents remain the same, but the right hand accents beats 1 and 4, creating a two-bar pattern. I am also adding seconds and fourths, which are called *suspensions,* to create movement and harmonic variation. The *G* in bar 1, the *D* in bar 2, and the *B* in bar 4 (all seconds of their respective chords) and the *A* in bar 3 (the fourth of the chord) create a new harmonic identity.

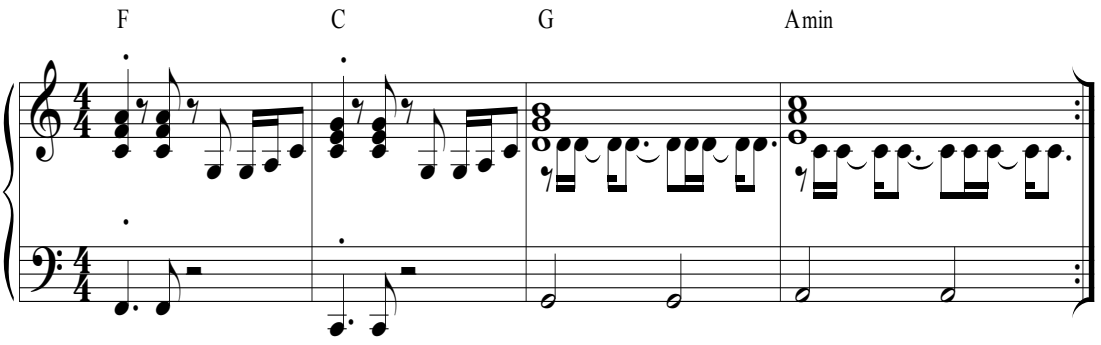
Ex. 3



Ex. 4



Ex. 5



3. Arpeggios and the Eighth Note Pulse

Remember those arpeggios you practiced and played in your classical pieces? **Ex. 3** creates arpeggios in the right hand from same four chords we've been playing, with a bit of syncopation, and adds a quarter note pulse in the left hand underneath. Bars 1 and 3 have triad arpeggios. Bars 2 and 4 have a steady eighth note pulse with tones common to both chords.

4. Sixths

Ex. 4 demonstrates how using the interval of a sixth to connect chord tones is a great way to create motion and countermelodies. In bar 1, the *G* and *B* on the "and" of beat 2 are passing tones connecting the root and third on beat 1 to the third and fifth on beat 4. Remember to listen to the melody to make sure your note choices and rhythms don't clash. Experiment with the use of sixths in all four bars.

5. Rhythmic Punches and Single Note Hooks

Maybe there's no guitar on the gig and you're free to play busier. Or maybe the guitar is playing whole note chords. In this scenario, we can get more rhythmic and play a muted-guitar-like or horn-like figure. This becomes a rhythmic hook. There are two variations of this in **Ex. 5**. Bars 1 and 2 have chords accenting beat 1 and the "and" of beat 2 along with a single note line at the back half of the bar. Bars 3 and 4 have a whole note on beat 1 with a rhythmic single-note figure played while the whole note sustains.

You can mix and match these concepts to create motion of your own, and in a four-bar section you can use combinations of these ideas. Also, while I'm talking mostly about the right hand, try out different left hand parts, too. What you play in the left hand depends mostly on what the bass player is throwing down. ♫

Bio

"Listen to what other instruments are playing. The choices you make should depend on how your part grooves with the other players rhythmically and harmonically," says keyboardist and composer **Clifford Carter**, best known for his work with artists James Tayor, Patti Scialfa, Idina Menzel, and others. Carter is currently touring with Cyndi Lauper, performing concerts in the United States and Europe. Find out more at cliffordcarter.com.

Clifford Carter with Tabitha Fair: "Who You Were."

Hear Clifford Carter play the audio examples from this lesson.

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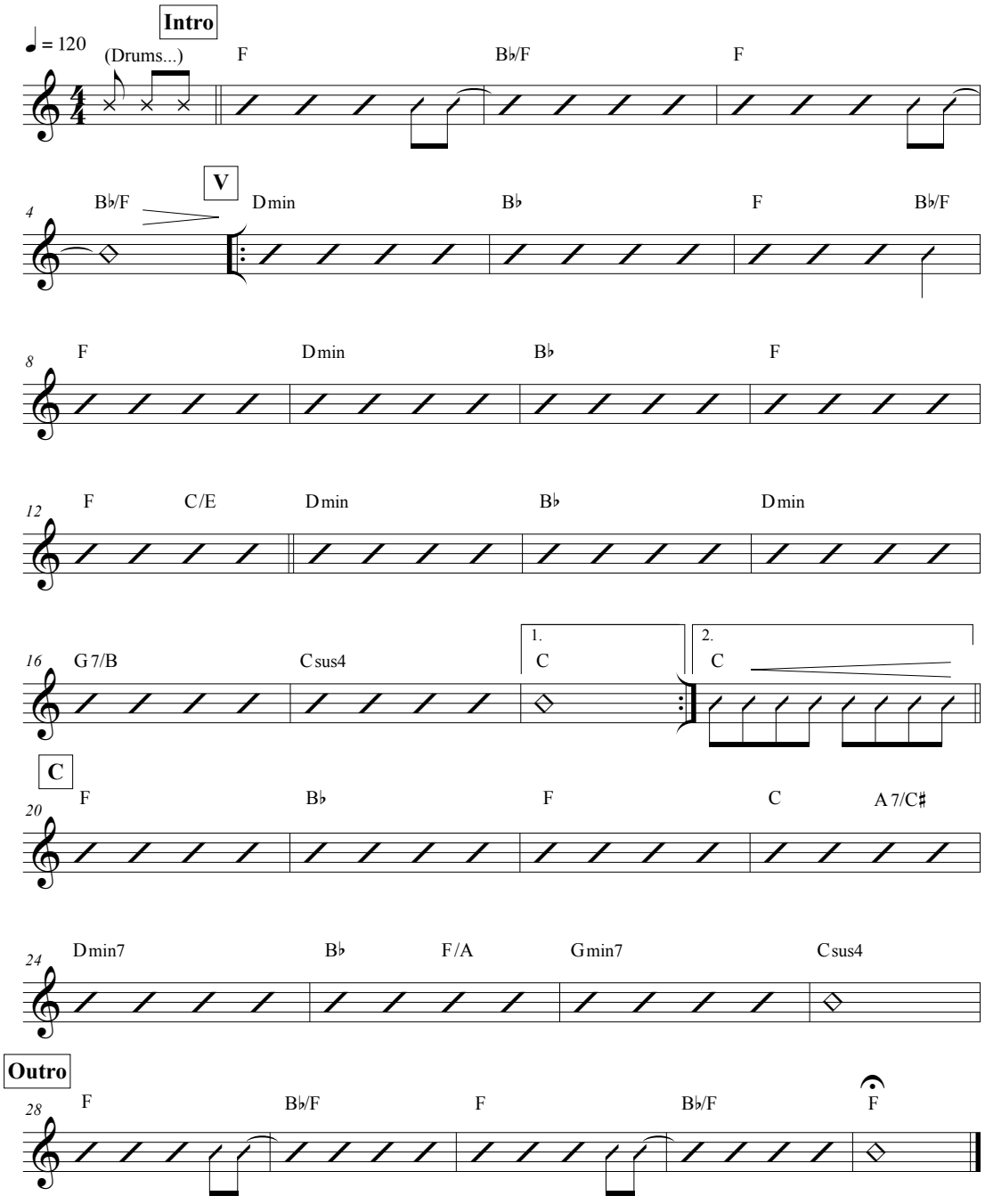
The Nashville Number System

BY MATT ROLLINGS

THE METHOD FOR WRITING CHORD CHARTS KNOWN AS THE NASHVILLE NUM-ber System was originally developed in the 1950s by Neal Matthews Jr. who was working with the Jordanaires, the vocal group best known for singing with Elvis Presley. Charlie McCoy, the legendary Nashville session player, is generally credited with perfecting the method and bringing it to widespread use in the studios of Nashville. In a nutshell, the number system is a way to write a chord chart that can be played in any key without transposition. The only thing required is knowledge of the intervallic relationship of a note within a key, because the numbers refer to the scale tone on which a chord is made. **Ex. 1** is a typical chord chart in *standard* format, and **Ex. 2** is the same chart in the Nashville Number System.

Ex. 1

Because we're in the key of *F*, 1 is an *F* major chord, 4 is *B♭* major (built on the 4th degree of the *F* major scale), and 5 is *C* (built on the 5th degree of the scale). An "m" next to the number makes it a minor chord. A "slash" chord, as in bar 2 is simply an inversion of some sort. For example, in bar 2 of Ex. 2, the chord indicated by 4/1 is the chord built on the fourth degree of the key (in this case a *B♭*) with the 1 in the bass (which, in this case, is an *F*), a B♭/F in standard notation—fairly intuitive. Similarly, in bar 12, the 5/7 chord is a *C/E*; that is, the 5 chord of the key (a *C* major chord) with the 7th degree of the key (an *E* in the key of *F*) in the bass. Compare the traditional chord chart to the number chart to see how they relate.

In the Nashville chart you'll see chords with a ♯4 or ♭5 in them. These are extensions, just as you would expect if you saw them in standard notation. In the Nashville system, however, the first number written relates intervallically to the main key. So in bar 16 of Ex. 2, the 27/♯4 indicates a *G7* (the 2 chord in the key of *F* with a dominant 7th extension) with the ♯4 *in the key of F* (a *B* natural) in the bass: In other words, a *G7/B* in standard notation. Similarly, when you see 37♯5 in bar 23, you would play an *A7/C♯*.

The system took hold in Nashville for several reasons. First, in general, the harmonic content of the songs is fairly simple and diatonic. So it was easily rep-

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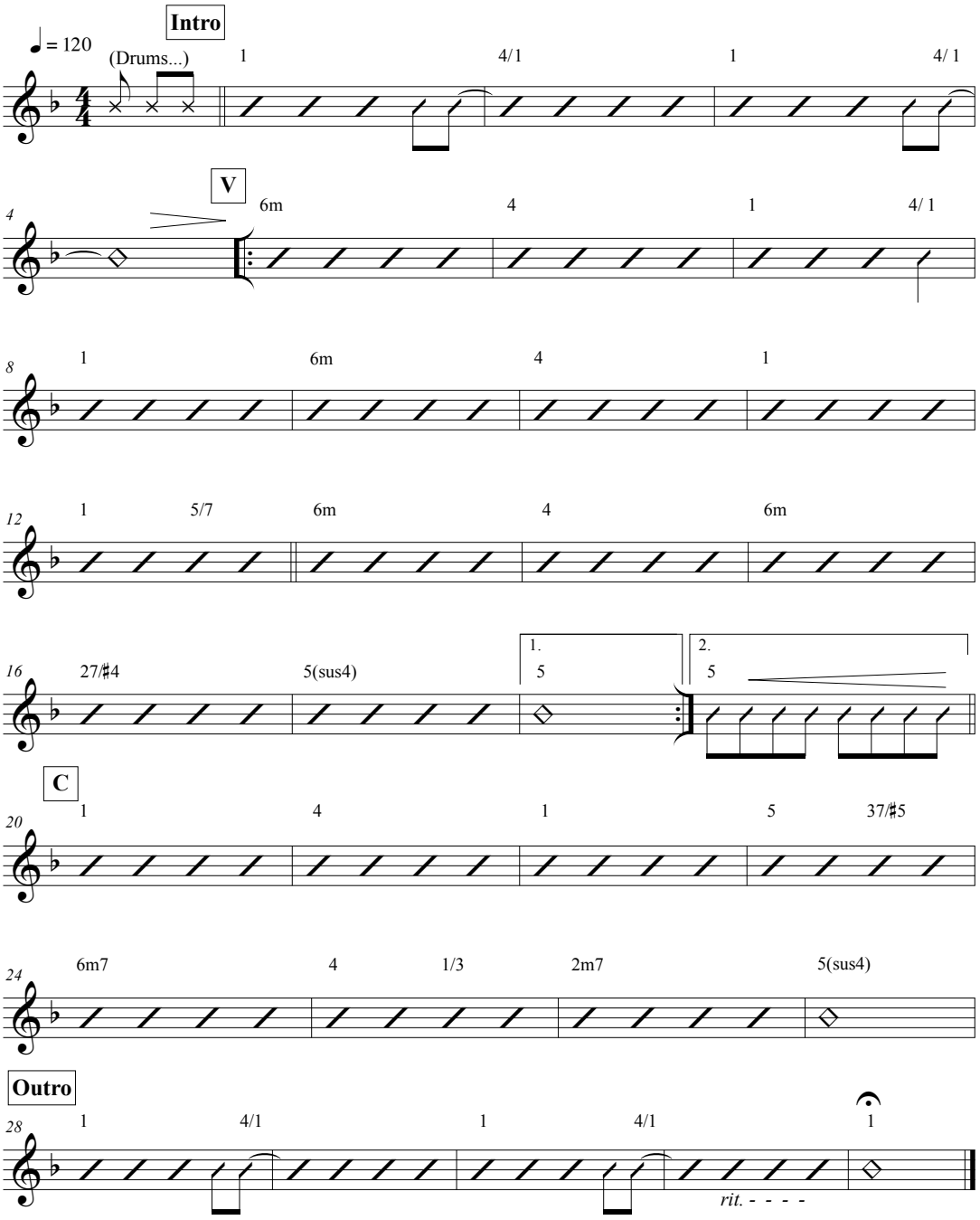
Ex. 2



resented and understood in this format. Second, it is very common for a singer to change keys (usually up or down a half step) in the course of a recording session. For anyone who's ever had to transpose a written piece of music or traditional chord chart on-the-fly, it is easy to see how a number chart could be useful: Whatever key the song is in is represented by the number 1, and a number chart is always in the key of 1.

Note that bars 2 and 4 are being "pushed"—usually an eighth- or quarter-note anticipation of the chord. I wrote in the rhythm to indicate an eighth-note push, but different people notate this in different ways. Sometimes a **>** symbol is put just to the left of the chord to be anticipated, and it's decided in the room whether it's an eighth or quarter note push.

Nashville recording sessions are unique in that, in general, they are a true collaboration between the artist, the producer, and the musicians. On a session, the chart would be read by everyone, but each musician would compose their own part based on the road map given to them. As a pianist, I would look at this map after hearing the demo of the song (or maybe the artist playing it in the room for us), and play what I think is appropriate for the record: I will decide what inversions to play, how much or little I play, what my comping rhythm is, and so on.

The rhythmic and harmonic information on the chart will need to be honored (I won't play a 7♭9 where only a 7 is written, or disregard a notated rhythm). But the way I play the chords and rhythms within that framework is up to me. The producer and artist will have varying levels of input in this depending on who they are and what the situation is.

As you can see, the number system is very intuitive and "gut" based. As a result, it allows you to keep the creativity flowing as you hone in on the more important aspects of a song, such as the vocal performance and the arrangement. ♫

MIKE HUMENIUK

Bio

"The number system does have its limits. As a piece of music gets more complicated, there is a point at which standard 'lettered' chord symbols are required," says **Matt Rollings**, an acclaimed keyboardist, composer and producer based in Nashville, Tenn. Rollings has performed on countless recordings and onstage with artists such as Lyle Lovett, Mark Knopfler, and Mavis Staples. Most recently, he co-produced the new Willie Nelson album of George Gershwin songs entitled *Summertime*. Find out more at mattrollings.com.

Matt Rollings performs with The New Nashville Cats.

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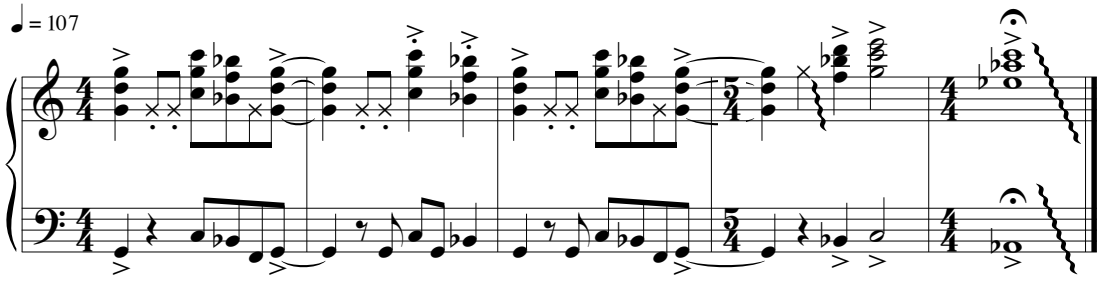
COMPETING WITH GUITARS

BY ANDY BURTON

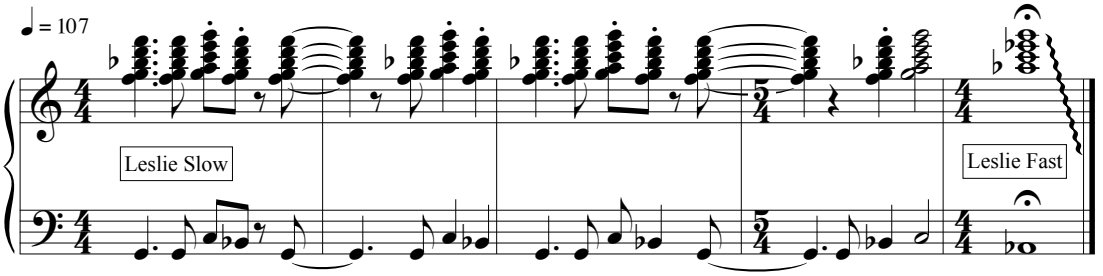
IF YOU'RE A KEYBOARD PLAYER WHO PLAYS in rock bands, I'm sure you are aware of some of the challenges we face. Being the other, often secondary, source of chords and melody besides the all-important electric guitar means your playing can easily get lost in the mix, whether in the studio or onstage. How can rock organists better compete with guitars? Here are some solutions to this age-old question.

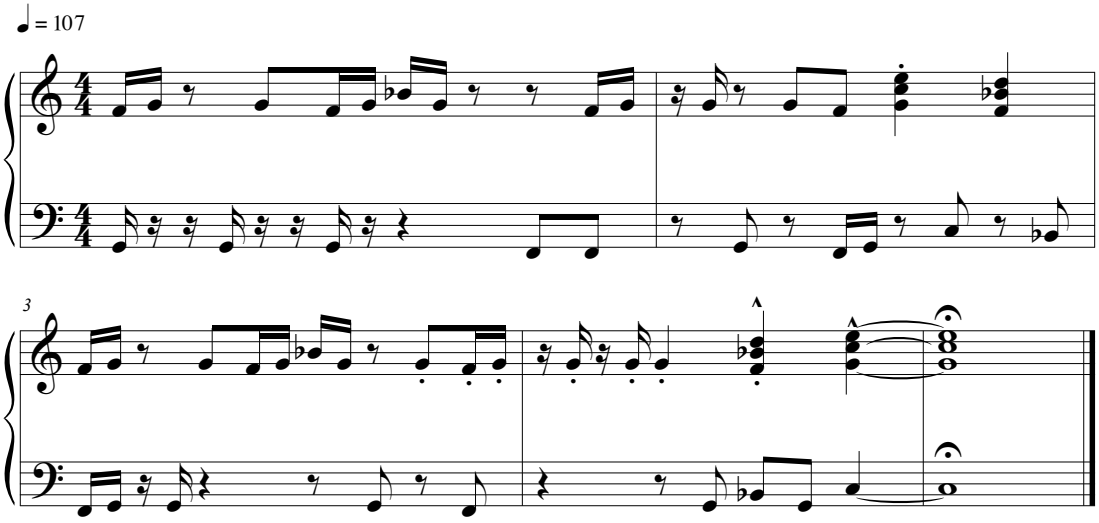
Ex. 1

Drawbars: 888800000, Leslie Slow or Stop, Overdrive, lots of Key CLick



Ex. 2

Drawbars: 888800000, Relatively Clean

Ex. 3

Drawbars: 868000000, Perc. 3rd, Fast, Loud, Leslie Slow, Overdrive

1. Do a Deep Purple

Ex. 1 illustrates how to rock out your organ with overdriven root-and-fifth power chords to generate a slightly different (though equally aggressive in its own way) texture to match and lock in with the guitars. Jon Lord did this brilliantly with Ritchie Blackmore's guitar in Deep Purple way back in the early 1970s. To do this today, you'll need convincing Leslie overdrive (rotors on *slow* or *stop*), or just use a tube amp or amp simulation on the pure organ tone. Percussion and Chorus/Vibrato are optional. If you can't beat 'em, join 'em!

2. Borrow from Jazz

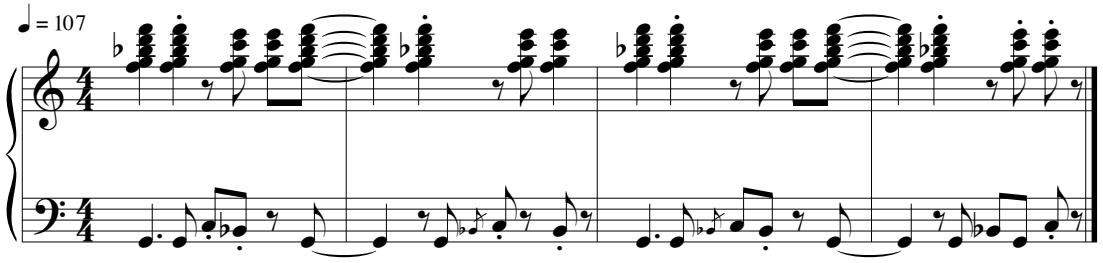
Ex. 2 adds a little bit of something to the mix that the root-and-fifth-heavy rock guitar parts tend to lack. A dominant or major seventh, ninth, or even an eleventh or thirteenth chord over a bare-fifths guitar power-chord helps you stand out harmonically and gives three-dimensional depth to a rock band's sound. (Just make sure to keep things rocking or you may get funny looks from bandmates who frown upon such a show of sophistication!)

3. Use Percussion

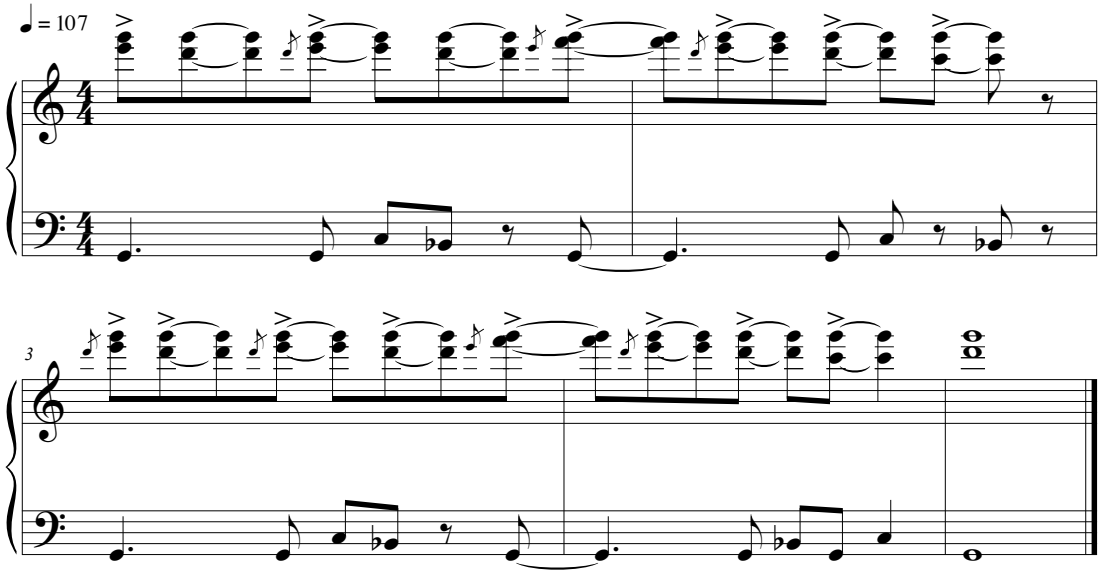
Ex. 3 takes the path that started with Jimmy Smith and moved into rock territory with giants like Ian McLagan, Keith Emerson, Jon Lord, and Rod Argent. Become part of the unbroken line of aggressive Hammond players who use the bite and "thunk" of the Hammond B-3's percussion to rival the immediacy of attack that a pick has on six amplified guitar strings. In a funky, almost clavinet-like way, you can dance around rock guitars rhythmically.

Ex. 4

Drawbars: 878616545, C-3 Vibrato, Leslie Fast



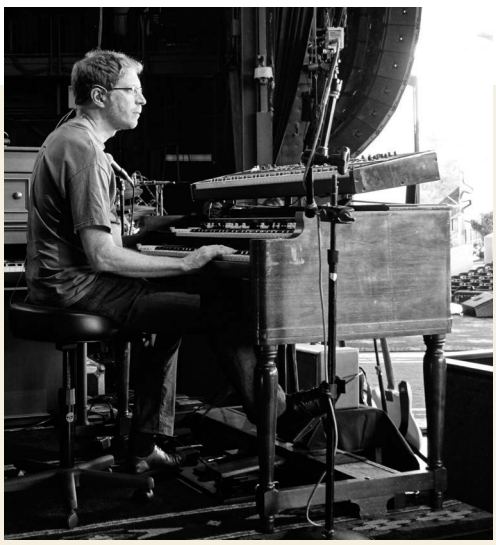
Ex. 5

Drawbars: 876444687, C-3 Vibrato, Leslie Fast

4. Add Air

The organ's upper drawbars provide overtones with a lot of high-frequency information, which our ears naturally hear as more direction-specific than lower and mid-frequencies. **Ex. 4** takes a drawbar registration that makes liberal use of those upper partials from the high drawbars, and combines it with some shimmery chorus vibrato and a good stereo-miked Leslie (or stereo Leslie effect). The result is a great swirling soup of sound that floats above all the racket. The emphasis here is on *stereo*. Some detailed high-end air, swirling between left and right at varying speeds, can pull the whole organ sound into its own space, where it can shine without bothering (or being bothered by) the other instruments. Shout out to July cover artist David Rosenthal for personally impressing upon me just how vital the stereo field is for keyboardists in general. (Note: this effect can also be achieved to an extent with crosstalk and/or capacitor leakage, unintended background noise sources which exist naturally in real tone-wheel Hammond organs and are often provided as adjustable parameters in various clone-wheel simulators out there for added realism).

5. S is for Sustain

Ex. 5 explores another area where you've got the guitars beat: The organ can sustain a note longer than even the sweetest vintage gold-top Les Paul! So while the guitars are chugging away and their notes are dying out, try flying a few held notes above the fray. Keep them changing and moving with something the guitars lack—a sparkling chorus vibrato, churning stereo Leslie, a note choice of a 7th, 9th, 11th, or 13th (see Ex. 2) and/or some upper partials courtesy of the high drawbars that the guitars aren't covering (see Ex. 4). A little melodic motion and smooth blues inflection won't hurt either. ♫



ALEX ALVAREZ

Bio

Keyboardist, producer and composer **Andy Burton** has toured with artists such as John Mayer, Rufus Wainwright, Curtis Stigers, Ian Hunter, and Robert Plant. He has played on *Billboard* chart-topping and Grammy-nominated albums and television soundtracks, including HBO's *Vinyl*. Look for Burton's upcoming solo album and other all-star collaborations soon. Find out more at twitter.com/andyburtonmusic.

Watch Andy Burton play an organ solo with The Smithereens.

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More Than Simply MKI vs. MKII

THE DESIGN EVOLUTION OF RHODES' ELECTRIC PIANO IS NOT SO CLEAR CUT

BY JERRY KOVARSKY

I OFTEN READ DISCUSSIONS ON THE WEB WHERE PEOPLE MAKE DEFINITIVE claims about the sound differences between a MKI Rhodes electric piano and a MKII. I have been guilty of this same transgression, and it is a gross oversimplification of the subject matter. Being a hand-built, electromechanical instrument, the truth is that every Rhodes could vary a bit in sound, and in the "finger-to-sound" connection. How the instrument was set up, voiced, and maintained also has a lot to do with it. But the bigger issue really is that the MKI instrument went through many changes over its lifespan before the MKII came out, and knowing which MKI you are comparing to which MKII is paramount to the discussion. Follow me down the rabbit hole and I'll explain.

The Life of the MKI

The MKI Rhodes suitcase came out in 1969, and it was a Fender Rhodes branded instrument, quickly followed in 1970 by the Stage model. These were both 73-key instruments, and they had black plastic lids. I mention the lid, because the previous models (1965-69) have been dubbed "sparkletop" due to their flecked lid design. It is this classic instrument that first made the Rhodes sound famous as used by Herbie Hancock, Chick Corea and Joe Zawinul with Miles Davis; by Bill Evans on *From Left to Right*; by Billy Preston with the Beatles on "Get Back," and many other tunes. This design had a felt, teardrop hammer design (see Figure 1), giving it a softer, warmer attack and a more bell-like tone.

When the MKI was first released it had hybrid wood-plastic hammers, with a plastic shank and a wooden head (see Figure 2). The first tips were made of felt and glued into a slot in the hammer head (see Figure 3), and they sounded more like the early sparkletop. But the felt tips would wear down quickly and need replacement, so in early 1971 the factory switched to Neoprene tips, which are the most common ones you will find. In late '71/early '72 the tone bars were changed from a fat block iron (or aluminum with a counterweight) design to a twisted steel shape, which had an effect on the sustain and duration of the sound. Tim Warneck of Retrolinear discovered that, in mid-1972, the pickups were changed to allow for a larger input signal and for closer proximity to the tine without too much saturation and distortion.

So you already see that in the first few years of the MKI there were major changes in the design. Everything I could find showed that Harold Rhodes was constantly tinkering with the design of the instrument in an effort to improve the sound, the reliability, and the durability.

In 1974, the name Fender was dropped from the piano faceplate. This was done so dealers that were not authorized to sell Fender guitars and amps could stock and sell the electric piano. In 1976 the hammers were changed to an all-plastic design, and some other changes were made which greatly affected the action. They were harshly criticized, and by 1978 things were worked out so that post-'78 pianos are lauded for their good action (thanks in part to a return to the key pedestal bump that was a part of the early sparkletop design).

The Tine Timeline

The tine (a metal rod that is struck by the hammer) is an important element of the Rhodes sound, and how much or how little of it is present in the sound can be controlled by the voicing of the instrument (see this month's Coda, page 50). But there were changes in manufacturer and design, and the techs I interviewed differ on its importance. Max Brink at Chicago Electric Piano Company feels they are important, and he is a fan of the Torrington-era (1970, switching to a tapered design in 1971, and lasting until around mid-1977. Previous to that, Raymac made the tines.) Chris Carroll at Vintage Vibe feels that the tine changes were not as critical, although some sustained better than others within any vintage. His business manufactures their own based on the Torrington design. In mid 1977 the tines were changed to ones made by Singer, and they have been described as more durable, but less bell-like. The Singer tines were quickly changed to ones made by Schaller, mostly for quality con-

Fig. 1: The teardrop shaped felt hammer used in the early "sparkletop" Rhodes, circa 1965-1969.

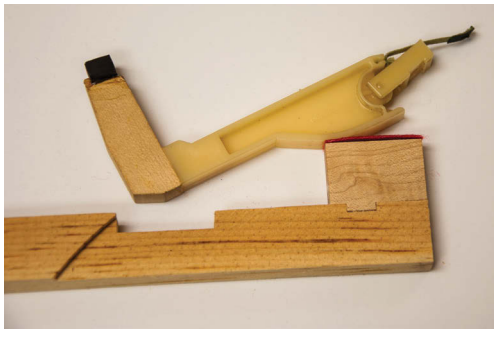


Fig. 2: The first MK1 hammer design, with a plastic shank and a wooden head.

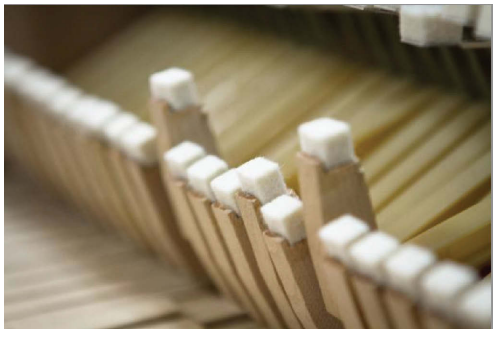


Fig: 3. The rare early MKI Rhodes felt hammer tips, used in the first year or so of production.

Fig. 4: The three major tine designs. The differences are not easily seen; they need to be heard.

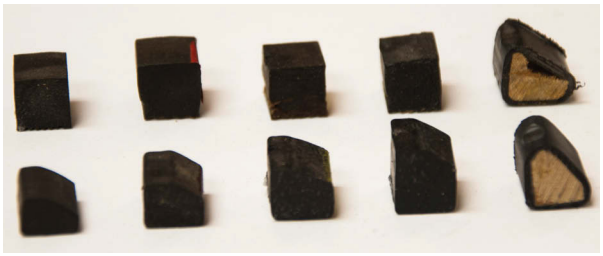


Fig. 5: The classic neoprene tips (top) compared to the later graduated tip design (bottom).

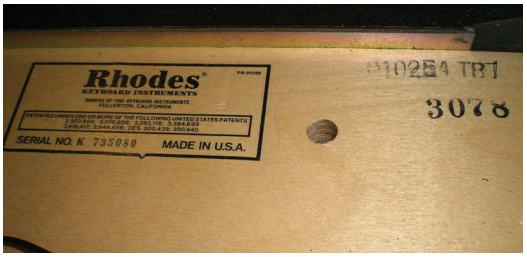


Fig. 6: The date stamp, in the upper right of this photo, found on the inside of every Rhodes piano.

trol, and it is unclear exactly when this happened. Suffice it to say that pianos made from 1978 and later have the Schaller-made tines (see Figure 4).

Ken Rich of Ken Rich Sound Services in L.A. describes them as "sweeter, but not as punchy." Max Brink describes them as "a bit more balanced in the harmonics, which lost some character." Tim Warneck reminds us that these differences are all about the tone and complexity of the initial attack: All Rhodes settle into a very pure sine wave tone during their duration and decay.

A Change in Hammer Tips

Max Brink stated that "The original cubed rubber tips gave a unique tone that had deep lows and more crystal-clear highs. The early cubed tip sound is today the quintessential part of the Mark I Rhodes sound, which lasted until early 1976." In 1976 they changed to a tapered tip design, where the height of the hammer tips varied across different ranges of the keyboard (see Figure 5). This was not a welcome design change, and technicians state that it is hard to voice a balanced sound without obvious transition points using these tips. So why did the company do this? Most experts agree that it was to reduce the time needed to set the strike line of the hammers, reducing assembly time. This design change, along with a now aluminum harp frame (opinions differ on whether this change affects the sound or not) constitute the MKI sound of 1978 and early 1979. And it is identical to the sound of the MKII as it was first introduced!

Enter the MKII

When the MKII was introduced in late 1979 the main change was in the lid of the piano. The rounded plastic top was changed to a ribbed flat top, better for stacking another keyboard on top of it. There were others changes to the design as the MKII progressed, but they related to the key action and internal assembly issues that had no effect on the sound. But all the techs groused about these changes as it relates to their ability to work on the instruments. Tim Warneck observed that, due to constant pressure at the factory to reduce assembly time, the MKII's rarely left the factory set up well, and that may account for some negative perception of those instruments.

How Do You Know?

This is all great information, but how can you clearly identify which model is which? Luckily, every Rhodes was stamped on the frame with a number that represented the week and year of manufacture (see Figure 6). The first two numbers represent the week, the second two the year. So the figure tells us that my MKI suitcase was made week 30 in the summer of 1978. Ideally, when you shop for a used Rhodes, or when a company develops a new Rhodes sound library/physical model, they would identify the source by at least the year. This is not a perfect science, as parts were not transitioned cleanly at the factory: They would want to use up inventory rather than throw it out, so there will surely be hybrid combinations of tines, hammers, and so forth in a given instrument near the design changes I have listed. But it would help to clarify some aspects of the design and ensuing sound.

Personal Favorites?

Every tech that I spoke to had eras of Rhodes that they held up as the pinnacle of design and sound. For Ken Rich it ranges from 1972 to the first few months of 1975. The '72-'73 had a gritty edge to the sound, and his favorite instrument, from 1974 has what he describes as a "buttery deliciousness" to it. Max Brink loves 1974-'75 Torrington-based suitcases and feels it was the pinnacle of 88-key models. But he quickly added, "Many players prefer the late-era MKI/MKII's more balanced tone to the beefier sound of the early and mid-era MKI." Tim Warneck had an interesting take on this: He would marry the action and feel of the late MKI to the tone production assembly of a '71-'72 for the perfect "Frankenstein." Chris Carroll prefers instruments from 1971-1973, with a fondness for the sparkletop sound as well. He reminds us, and everyone agrees, that the majority of sound differences can be mitigated through careful voicing, save for the differences in felt-versus-rubber hammers and some pick-up characteristics.

Closing the Lid

People want definitive answers and clear-cut differences, and in the case of the Rhodes sound that isn't possible. Every instrument can sound a little different due to the mixture of parts, the vagaries of hand assembly, and varying setup care. But hopefully my research will help to lead the discussion into what year Rhodes rather than what Mark revision we're talking about when describing an instrument. ♫

(Special thanks to Frederick Adlers and the Rhodes Super Site for their research and timelines, and to all the techs who shared so much of their accrued expertise.)

Rhodes Specialists and Information Sources

Chicago Electric Piano Company
chicagoelectricpiano.com

Down the Rhodes (DVD)
fenderrhodesstory.com

Ken Rich Sound Services
kenrichsounds.com

Retrolinear
retrolinear.com

Rhodes Super Site
fenderrhodes.com

Vintage Vibe
vintagevibe.com

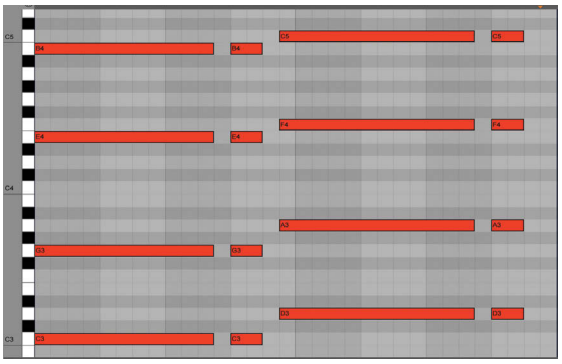
Mixing Pads

ENHANCING YOUR CHORD PROGRESSIONS WITHOUT RESORTING TO EQ

BY FRANCIS PRÈVE

PADS AND CHORD STABS ARE ESSENTIAL COMPONENTS IN ALL MUSICAL GENRES, WHETHER THEY'RE USED SUBTLY AS reinforcement or as the main focus of a track. While some pads are heavily treated with lowpass filtering to help them blend into the background of a track, some mixes benefit from highlighting the pads. In the latter case, the pads' note clusters, especially when using bright sawtooth waveforms, often result in a loss of valuable frequency space in a mix.

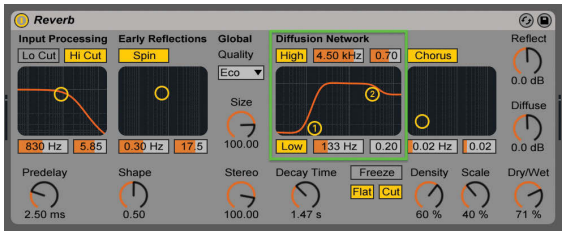
This month, we'll look and listen to three different approaches for sculpting your pads so that they sit better in a mix (both in live performance and studio contexts), allowing the other tracks to breathe without losing the impact of clearly defined chordal elements.



Open Voicing. Music theory Ninjas use a trick that's often overlooked by pop songwriters—open voicing. By distributing the notes of a chord over multiple octaves, the harmonic density of bright sawtooth chords—especially seventh chords in the octave around middle C—is minimized, allowing them to sit a bit higher in a mix. For example, you can open a seventh chord by transposing the 3rd and 7th up or down an octave.

Pro Tip: This is also a great way to create convincing string passages when using orchestral sample libraries.

Notch Filtering. A time-honored engineering trick for pads is to apply highpass filtering to chordal tracks in a mix, thus leaving room for instruments in the lower frequency ranges. An even more precise method for this technique is to use a 12dB notch filter (with minimal resonance) within your synth patch, then carefully adjust the frequency of the notch as you're mixing the pad into the track. By doing this, you're creating an EQ cut on each note *individually*, as opposed to attenuating a wider range of frequencies after the fact. This image shows Xfer Serum's notch filter, which is excellent for this technique, thanks to its impressive "drive" and "fat" parameters. On the analog side, the Dave Smith Instruments OB-6 includes the Oberheim notch filter option, adding a touch of organic warmth to the approach.



Reverb Sculpting. Most modern reverbs include parameters for low-frequency damping, which causes the lower frequencies in a reverb to decay faster than the high frequencies. By adjusting this parameter in an extreme manner, then finessing the high-frequency damping or integrated EQ to tame any shrillness, you can use a reverb as a complex stereo enhancement on the pad. From there, you can tailor the pad's lower mid frequencies by simply adjusting the wet/dry balance to taste, leaving room for more midrange detail in your mix. ♫

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CASIO MZ-X500

BY STEPHEN FORTNER

Keyboard K KEYBUY AWARD

ARRANGER KEYBOARDS ARE SOMETHING OF A KNOWN QUANTITY THESE DAYS. All serve up a buffet of sounds, "one-person band" accompaniments that follow your chord changes, the ability to record your performance, and bells and whistles such as auto-harmony. Powerfully musical in experienced hands? Yes. Cool, easy-play factor for beginners? Of course. Hip and relevant for 2016 onward? Opinions diverge, but the Casio MZ-X500 might make them diverge less.

With the Casio MZ-X500, Casio tried to give us a new take on an arranger and wound up offering a *very* robust multi-timbral synth workstation with a contemporary and fun user experience in the bargain. Its bang for buck is off the scale.

Features Overview

My first impression of the MZ-X500 came from its industrial design. Yes, it's plastic, but the fit and finish are excellent and everything feels very tight.

As on most arranger keyboards, Registrations act as snapshots of pretty much everything in the machine. In general, navigation is very easy, though occasionally "so easy it's hard" if you're used to synth workstations of the past 20 years—on the Casio, the thing you're looking for is almost always more in-your-face than you think.

Three buttons on the right side of the color touchscreen assure you that you can always get back to where you came from; the Main button is home base for everything going on in the current Registration, and the Menu icon offers cheery-looking icons for anything that can be selected or edited, such as Tones, Rhythms, effects, and the extensive mixer, which manages all multi-timbral parts in the machine plus incoming external audio.

Speaking of external audio, the MZ-X500 is well-endowed with inputs—stereo 1/4" line, TRS mic with a physical trim control, and 3.5mm stereo for an MP3 player. You can apply the keyboard's effects to the mic and line inputs, as well.

In the effects department, two DSP slots function as Inserts and include a variety of useful algorithms. After that, you get Sends with chorus,

Snap Judgment

PROS Excellent sounds in all categories. Deep sound editing. Accompaniment styles/rhythms are musical and satisfying, with custom styles easy to record and save. Drum pads perform many cool tasks and integrate seamlessly with arranger section. Onboard speakers play loud and clean.

CONS Keyboard action is on the low-cost side. Neither keys nor pads sense Aftertouch. Many great features are under-documented, even in supplemental tutorial downloads.

Bottom Line

Part arranger and part pro synth workstation, the MZ-X500 punches well above its price class in terms of sounds and features. More importantly, it's serious fun.

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reverb, and delay. A master EQ and compressor put the final spit and polish on the mix.

The 16 velocity-sensitive pads do several different things. Factory modes include one-shot samples such as drum hits, programmable chords, and musical phrases appropriate to various sounds. The pads can also trigger articulations (MIDI-generated, not alternate audio samples) that you select from a generous factory bank that ranges from bends and crescendos to choppy dance-floor gate effects.

It gets better. In User mode, you can mix and match these functions *on a per-pad basis* and save your custom setups. Using the easy Pad Record function, you can play your own phrase into each pad, overdub onto that phrase (with the same sound), and program custom chords. You can even sample your own audio to a pad via the audio inputs. The pads can drive or be driven by the accompaniment styles that you interact with via the intro, variation/fill, and fade buttons, with everything syncing to musical key and tempo.

Both audio and MIDI recording are onboard. The former lets you record simply everything—your playing, auto-accompaniment, and incoming external audio—to a USB flash drive as a stereo file. The latter is a full 16-track multi-timbral sequencer, and since it's on a separate internal MIDI port, it exists independently of the live keyboard parts and auto-accompaniment playback. (Bring up the Mixer and cycle using the Port button, and you'll see the sounds assigned to the tracks change.)

Physically, the only thing that says "budget" is the keyboard itself. The piano-lipped keys are nicely sized but quite springy and somewhat loose side-to-side. Play a glissando or wipe, and you'll hear 'em.

Sounds

Casio told me that under the hood, the MZ-X500 actually has more sonic horsepower than the Privia PX-5S (read our review at keyboardmag.com) and after checking out its factory Tones (sound programs) I believe them. You can play two upper and two lower tones at once, with an adjustable split point. Here are just a few highlights.

Acoustic pianos are on par with what's in the PX-5S, with a lot of dynamic range. I might not use them for a solo jazz or classical recital, but I'd do so for just about anything else—definitely any live band gig in any genre. The EPs offer a ton of variation and personality across the Rhodes, Wurly, Dyno, DX, CP, and Clav gamut. (Oddly, the EP bank is where you'll find mallet instruments.)

The organs are impressive, with drawbar control on the mixer sliders. Buttons toggle harmonic percussion and speed for a rotary simulation that gives a clear sense of distinct bass and treble rotors spinning. Foldback (repetition of extreme high and low drawbar frequencies) is reproduced accurately. Nothing is quite in the league of today's dedicated organ clones, but the overall sound is warm, realistic, and miles ahead of the static organ samples you would usually get in a keyboard of this type.

The synth sounds positively shine, and there are tons of them. Subgroups comprise leads, pads, bass synths, and Hex Layers. Originating on Casio's XW-P1 synth, these are six-way stacks that the machine treats as single sound programs. One among many addictive examples, PriviaSynth1, is as good for Prince's "1999" as I've ever used. The special Bass Synth group is monophonic: Its sounds range from simple sub-basses to Juno and Minimoog territory to post-modern buzzsaws.

Many of the guitars and basses are new and the nylon guitars are especially delightful. Orchestral sounds include some great new solo instruments that take full advantage of the pad-based articulations mentioned earlier. World instruments are plentiful, with emphasis on China and Indonesian gamelan.

Sound editing goes much deeper than I expected in an arranger at this price point: filter cutoff and resonance; amp attack, decay, and release; entry volume, and velocity sensitivity are adjustable per Tone from the first editing screen. Hitting the Advanced icon takes you to even more fine-grained control, including graphical pitch, volume, and filter envelopes. You also get independent and highly programmable LFOs for pitch, filter, and amp (volume). Effects settings are editable per Tone as well, and you can save your creations as User Tones. There's no "oscillator" editing; any User Tone begins with the multi-sample of some factory Tone. If that makes the MZ-X500 less than a full and true synthesizer, it's only just barely.

Synth-style performance control comes by way of the K1 and K2 knobs, which you can assign to any MIDI CC. Each knob can control two parameters at once, with different ranges and reverse polarity if desired. Knob assignments, however, are saved at the level of Registrations, not User Tones. This seems related to the fact that each of the two parameters under a knob's control can affect all four Tones in the Registration. Though it's the same aspect of the sound across the board (e.g. filter cutoff), you can toggle whether each tone receives your knob twist.

Accompaniment

Casio calls accompaniment styles Rhythms; the Accomp On/Off button mutes everything but the drums. A style on the MZ-X500 is composed of 12 "elements" (song sections) that you can switch in real time. There are two intros, four main variations, four fills, an auto-fill option for when you switch variations, and two endings. Each element can make use of up to eight multi-timbral parts—drums, bass, five melodic/chordal parts, and additional percussion.

The factory styles are very good, with special attention paid to giving electronic dance and hip-hop styles some credibility and attitude. Latin, European, and pan-Eastern styles from Bali to Bollywood are also well represented. Of course, all of the standard rock, pop, ballad, and waltz fare is on hand.

Can you create your own styles? Yes, element by element and part by part. The tools here include a pattern sequencer with both real-time recording and an event list editor. You can also import Standard MIDI files.

Parameters governing how the accompaniment behaves are no less deep. Left-hand chord recognition can operate in a variety of fingered modes or the easy Casio Chord mode, which triggers full chords based on one- and two-finger input. You can set up fades and slowdowns, specifying the starting measure for each. An unexpected arranger feature is auto-harmony, which adds notes to your right-hand melody based on the left-hand chord. It's here, with a dozen voicing modes to choose from.

Another level of accompaniment consists of Music Presets, which add ready-made chord progressions to all the other goings-on as well as pre-selecting appropriate Tones. You can alter, rename, and save Music Presets in a step-based editor. For ease of use, this presents itself in terms of measures, beats, and ticks, and offers tools for adding ties, rests, and different note values including triplets. Powerful stuff, here.

Conclusions

The MZ-X500 strikes me as one of those rare items that is way better than it's supposed to be. I've only had room to scratch its surface here, particularly with regard to the way its various modes can interact to kickstart your music-making. There's a fusion going on here of a modern "producer" mindset with a traditional "arranger keyboard" paradigm.

As a synth, it's great-sounding and powerful enough to be the cornerstone of any band rig even if you never touch the accompaniment features. If you do, they've received a welcome hipness injection. As a studio tool, it offers multiple and fun pathways to quick composition. As a value, it's a definite Key Buy. ♫

Fig. 1: A screenshot showing the full Pianoteq 5.71 collection sound list.

MODARTT Pianoteq 5.71

BY JERRY KOVARSKY

SINCE WE LAST LOOKED AT MODDART'S PIANOTEQ MODELED PIANO/KEYBOARD collection in our July 2015 issue, the company has been busy adding new instruments to its already impressive offering (see Figure 1). As of version 5.71, Moddartt now offers a complete Hohner keyboard collection (Pianet N and T, and the ultra rare Electra Piano), a dual-register harpsichord, a MKII Rhodes electric piano, a Hamburg Steinway B piano, and a concert harp. I wrote in my previous review how Version 5 turned me from skeptic to a believer, and these new instruments only add to my appreciation of the fine work the company is doing.

Grand B Piano

This is the second Steinway offering from Modartt, a smaller Hamburg "B" model (6' 10.5", whereas the D measures 8' 11.75"), which was modeled after a piano lauded by famed pianist Martha Argerich for its playability and musicality (see Figure 2). The company states that it made subtle refinements to its piano model, resulting in a clear tone and "astounding dynamics." I found it to be a tasteful, subtle sound, one that might not make a strong impression on first play, but grows on you.

Piano sounds are so subjective, and one needs to spend time with them before making a final judgment. This is especially true of a Pianoteq model, seeing as you can adjust so many aspects of the sound and its playability: You need to be careful not to pass judgment on a piano based on a given, or a few presets. In my time with it, I grew to like it better than the larger D for all but the most bombastic playing needs. It has a more focused lower end, and midrange melodies could be played with a pleasing legato connectivity.

MKII Vintage Tine

Modartt told me that they had been working on revising and improving their pickup emulation, and when they got hold of a nice MKII Rhodes, they took the opportunity to model it and include the new pick-up characteristics. I really like how the MKII can bark more when played hard, and how moving the pickup closer brings you to a buzzier, saturated type of sound (check out the MKII Bark and Super Bark presets). The range of the pickup proximity has been extended and behaves more true to how a real Rhodes does.

While I really like these aspects of the new MKII, I don't like the sound of the tine element as much as the one in the MKI. So for darker, less bell-like sounds, the MKII is wonderful. Want more bell? Then I am drawn back to the MKI. This makes me wish Modartt would merge the elements into a single model where I could choose the "vintage" of certain parts of the instrument. While we're at it, I'd like user-defined velocity modulation of the level of the tine; when you dial it in, it's always there at the same level in respect to the body of the sound. Maybe I'm getting a bit synthetic in my thinking, but I'd like control over that.

I'm a fan of the George Duke school of Rhodes sounds, in that he liked a lot of low-end clank and noise in his sound. If you have the Pro version of Pianoteq, you get a Note Editor (see Figure 3) that

Snap Judgment

PROS Strikingly realistic and nuanced sound. Obvious company commitment to development and support. Light load on your computer.

CONS Whole collection gets pricey. The MKII tine element is not authentic to my ears.

Bottom Line

An already impressive product gets some varietal and unique additions. Highly recommended.

Stage: $129 (includes 2 instruments)
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Studio: $799 (all instruments)
Individual Instruments: $59 each
pianoteq.com

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allows you to adjust many parameters on a per note basis, so you can scale the level of the tine noise, or key-off clunk on a simple curve to emphasize one end or the other, or create subtly random level differences to make each key sound a bit different. This adds immensely to the realism of the sound.

Hohner Collection

We're all familiar with the venerable Clavinet, and Pianoteq has been offering a great model of it since 2010. Now it has added three more Hohner keyboards, with the approval and endorsement of the parent company, itself. The Pianet is a reed-based keyboard, where the reed is plucked by a soft pad, rather than struck by a hammer like a Wurlitzer. It was used by a number of artists in the late '60s and '70s, including The Beatles, The Zombies, Three Dog Night, the Guess Who, and Tony Banks on early Genesis recordings.

The two models included are the N, which has a more hollow reed-like quality, and the T, which adds a bell/tine element to sound like a delicate, hollow Rhodes hybrid. I like both of these sounds and am especially drawn to the N instrument (see Figure 4). It offers a nice alternative to a Wurly for delicate passages and can be shaped into a brash, funky instrument that works well in place of a Clav. It's easy to dismiss the T as a "poor man's Rhodes," but I enjoyed using it for some down-tempo neo-soul and more open, spacy playing. I added a Phaser and found it to be surprisingly fun to use. It's a fresh sound for your palette.

The Electra Piano is much more rare; most well known for being used by John Paul Jones for many of his classic Led Zeppelin parts (although he never toured with it). Yup, this is the instrument used for "Stairway to Heaven," "Misty Mountain Hop," "No Quarter," and others! It has that plucked reed quality of the N and just a bit of tine sound from the T, but it is much thicker and warmer than the T. I look at it this way: The collection is a steal at $59 (as an add-on) and I'd pay that for any one of these sounds. The Clav is indispensable, followed by the N for me. The other two are welcome additions.

But Wait, There's More!

Also included is a Hans Ruckers II harpsichord, and it is divine. It is the first dual-manual/dual-register instrument offered in this category, and I loved playing my limited repertoire of Baroque classics on it. Pedals can be used to insert a slight mute to the strings, or even a buzzing paper kind of sound. And adjusting the striking point on the string and the damper position opened up a world of new timbres. Highly recommended.

The Concert Harp models a Salvi-made instrument: It sounds beautiful and plays wonderfully. You can use pedals to play pinch harmonics (called flageolets), and another pedal setting mutes the attacks slightly for more realistic glissandos. While playing this instrument, I explored a feature I hadn't covered before: the ability to load new impulses for the reverb effect, with plenty of files to be found on the Internet. This opens up a world of wonderful acoustic spaces to place your sound in, and I was mightily impressed.

Mea Culpas and Conclusions

In the last review I complained about an always-present key-off element in the Clav that I couldn't remove. Spending more time with it, I found that the Damper Position and Damper Duration helped alleviate it. And I gave a Con to the interface for a lot of small text, completely missing the rather extensive Magnification controls that were added back in Version 4 (see Figure 5). Mea culpa.

In conclusion, Modartt Pianoteq is a great instrument collection that keeps getting better and better. When it comes to acoustic and electric pianos, we are always on a quest for "the best" and that is impossible to find. The best for a given tune, track, situation is a more reasonable attitude, and in my opinion Pianoteq must be considered when looking for these sounds. Would I give up Ivory or other mega-pianos? Not likely, but I can't say one is better than the other. Would I stop using Lounge Lizard or my UVI Tines Collection? Why? No one is forcing me to do so. I'm simply glad to have so many wonderful choices.

The best praise I can give Pianoteq is that it is seriously tempting me to bring a Mac Mini to my gigs so I can have access to all these great sounds when playing live, in spite of how good my Korg Kronos/Casio PX5S combo is. Now if it could only run on my iPad... ♫

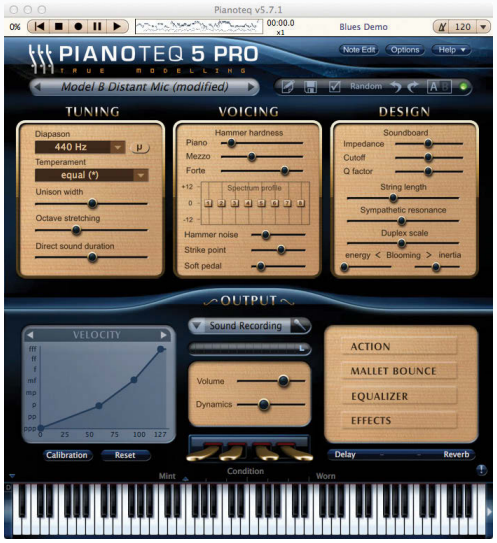

Fig. 2: The Hamburg Steinway Grand B piano.

Fig. 3: The Note Edit screen, showing per-key Tine Key-Off scaling.

Fig. 4: The Hohner Pianet N instrument, showing the Action parameters.

Fig. 5: The magnification controls offer welcome scaling of the interface.

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UVI Attack EP88

BY FRANCIS PRÈVE

OVER THE YEARS, UVI HAS DONE A TERRIFIC JOB CAPTURING THE FEEL AND flavor of vintage gear with its king-sized libraries for the UVI Workstation and Falcon hosts. Attack EP88—the latest addition to UVI's vintage offerings—is a bit different from previous products in that it deviates from slavish devotion to the original. Instead, it consists of an 88-key Rhodes piano that has been "prepared" with tacks in the hammers, giving the piano a harder attack with emphasized bell-like overtones.

That's not to say it sounds excessively artificial. After all, we've got the legendary DX7 as the gold standard for faux Rhodes sounds. Instead, the Attack EP88 retains all of the lovely, organic warmth of a real Rhodes, but with the added ability to cut through a mix without adding a lot of EQ. This makes it perfect for pop and house genres—so much so that I suspect it could become the next go-to instrument for house music connoisseurs.

As for the tech specs, the library's file size weighs in at a whopping 9.91 GB, so if you're buying online, this could well be an overnight download; and you'll definitely want to make sure you have enough storage space beforehand. That said, the package consists of 71 well-crafted presets that make great use of its 47,280 individual samples, which were recorded at multiple velocities through a range of signal chains that include DI, tube preamps, a contact mic, and both mono and stereo near-field mic pairs. Each approach has its own distinct character, and with careful editing of the integrated envelopes, you can coax traditional Rhodes sounds from this virtual instrument. Of course, that's missing the point here, as there are some truly unique recordings that spotlight both the tines and the mechanics of the action, which can be the ticket to getting that Boards of Canada or Radiohead vibe.

In addition to customizing the Rhodes instruments from a synthesis and dynamics standpoint, Attack EP88 also offers an array of integrated effects hardwired in series—overdrive, chorus, phaser, delay, and reverb. This is a classic configuration for electric pianos, and UVI's implementation does the trick for capturing that vintage sound. However, if you want more options, the UVI Workstation shell includes its own collection of processing tools, such as convolution reverbs, multiband compression, filtering, and other advanced effects. Taken as a whole, there's a lot you can do to process these instruments to the point where they sound utterly otherworldly.

UVI uses iLok copy protection, requiring either the iLok dongle or computer-based authorizations via the free iLok license manager. Moreover, UVI allows for up to three activations per product.

Overall, Attack EP88 is a wonderful product for Rhodes fans who are interested in the exotic. The instruments are all beautifully sampled and sound absolutely magical in a wide variety of musical applications. In fact, at the risk of sounding heretical, I may even prefer this Rhodes library to the real thing. It cuts through even the most dense mixes and sounds unique in more intimate contexts. If you're looking for something both unusual *and* practical in a virtual Rhodes, Attack EP88 is worthy of your attention. ♫

Snap Judgment

PROS Tacked Rhodes instruments cut through a mix, while retaining an authentic tonal body. Extensive customization options, thanks to multiple recording techniques. Adjustable velocity curves and envelopes. Integrated effects to add polish.

CONS 10GB file size could be a turn-off for some users.

Bottom Line

A unique approach to the classic Rhodes sound.

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Snap Judgment

PROS Comprehensive array of classic beatbox instruments. Essential macros such as tuning, decay, and Personality allow for quick customization of drums. AU format allows integration with GarageBand, ModStep, and other iOS DAWs.

CONS No standalone operation (AU only). Definitely need to crack the manual to get started.

Bottom Line

A must-have drum synth for electronic music lovers on iOS.

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BRAM BOS

Ruismaker for iOS

BY FRANCIS PRÈVE

BRAM BOS'S RUISMAKER IS MAKING WAVES AS THE FIRST EXCLUSIVELY AU-compatible drum synth for iOS. While Oliver Greschke's excellent Elastic Drums (available at keyboardmag.com) is arguably a deeper drum synthesis app, Ruismaker takes a different approach that may have a wider appeal, especially for artists looking for familiar drum-machine sounds. Since Ruismaker's percussion models run the gamut from vintage Roland to Yamaha-flavored FM percussion, its sounds are an obvious choice for synthpop and dance music producers.

Because Ruismaker is AU-only with no standalone version, clicking on its app icon simply opens a quick start guide for integrating it with sequencers such as GarageBand, ModStep and a few others. To actually use the app, you'll need to open your AU-compatible DAW and add it to a track. GarageBand, Cubasis and ModStep are all compliant with iOS's new AU standard, so there are quite a few host options right out of the gate.

Once you've got Ruismaker running, you'll be greeted with an interface that evokes Roland's TR-8 drum machine, which makes a lot of sense as the underlying tech bears a strong resemblance to Roland's innovative approach to modeling—not sampling—their classic drum machines.

Each of Ruismaker's eight pads can contain any of its drum models, which include 8 kicks, 9 snares and claps, 8 toms and congas (with high, mid, and low tunings for each), 13 percussion sounds, and 3 hi-hats. These models include impressive recreations of TR-808, TR-909, CR-78, and classic FM drum sounds, along with a few original tones that are quite useful, too.

Each sound can be individually customized via five parameters, including tuning, decay, drive, bit-crushing, and a Personality knob that varies in function depending on the selected drum model. For example, on the Roland kick emulations, Personality adjusts their specific attack characteristics, whereas for the hi-hats, it governs either bandpass cutoff or the metallic components of the sound, depending on the selected model. There are also controls for volume, panning and send level to the integrated delay for each drum.

Globally, there are additional parameters for delay time, feedback, and randomization, which gives each drum hit a slight change in character, much like you would get from real analog gear. There are also reverb and compression knobs that affect the kit as a whole. And in an interesting touch, nearly every parameter has its own MIDI CC assignment, allowing you to change parameter values via continuous controller messages, which is awesome if you're using a compatible control surface like Korg's nanoKontrol.

Obviously, the bottom line for any plug-in, iOS or otherwise, is its sound and Ruismaker doesn't disappoint. Though the TR-inspired sounds aren't 100 percent identical, they're fantastic emulations that serve the same purpose, and many listeners won't hear any significant differences in the context of a mix. That said, I would have loved to hear the 909 dual-oscillator toms included in this collection, though the Simmons-like models are excellent alternatives. As for the more original drum sounds, they're *all* useful for electronic music production.

While I wish Ruismaker included standalone operation and the ability to save entire kits, these features could come in an update at some point. Until then, Ruismaker is a fantastic value at five bucks and deserves a home in every compatible iOS DAW. It's flexible, easy to customize and really hits the sweet spot for electronic music production.

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5 WAYS TO MAKE YOUR Rhodes Piano Play Better

BY CHRIS CARROLL

IF SOMEONE CAME UP TO ME AND SAID, "YOU ONLY HAVE ONLY FIVE STEPS to make Donald Fagen's Rhodes ready for his recording session tonight," my initial reaction would be, "That's hard," because so many variables determine how a piano sounds and plays. But for the sake of this article, and to inspire players to reach for improvements they can make now, here are five steps to help maximize the playability of your Rhodes.

1. Key Bed Setup

I cannot stress the importance of this first and most important aspect. Before addressing other procedures, a Rhodes key bed must be set to the proper height, key dip must be verified to your liking (usually 3/8" ± 1/16"), and keys must be leveled and squared to the key slip of the case. The feel and performance of the key bed has a direct correlation to how your piano feels and responds. It also forms the foundation to how all other setup procedures are balanced and supported, and how they operate. You will set your key height; level all keys, square to the key slip of case, and check key dip. Once the key bed has been set, you can determine whether you need an action modification known as the "Miracle Mod" for any piano built before 1978. It is at this point when you would install that modification to the piano if needed.

2. Escapement and Strike Line Adjustment

Most Rhodes pianos can be improved by adjusting two specs, the escapement and the strike line. The escapement is the relationship or "blow distance" between the hammer tip and tine. By depressing a key into its farthest point without going into "after touch," you find the point where you will measure the escapement gap. Proper escapement will allow your piano to respond to a softer touch more evenly across the piano, as well as offer you the optimal hammer "blow" to the tine. There are different ways to achieve escapement: by adding or removing shims to the harp supports (this lowers or raises the harp on each side), by adjusting the rear tone bar screw closest to the keys to a standard height of 3/8", and by utilizing graduated hammer tips. Anytime escapement is changed, hammer tips are changed, tines are replaced, or if you just are not quite sure you are hitting the "sweet spot," it is likely that a strike line change is needed. This is done by removing the screws on each side of the harp so that you can adjust the harp back and forth while striking notes such as *C*s and *F*s up and down the keyboard, all the while listening for that sweet "crack" of the tines.

Chris Carroll is the founder and president of the Vintage Vibe Electric Piano Company, an instrument retail, restoration, and repair shop. Vintage Vibe is also the maker of the Vintage Vibe Electric Piano and Vibanet. Find out more about Carroll, and Vintage Vibe's products and services at vintagevibe.com.

3. Damper Adjustments

Another important element responsible for the way your Rhodes piano feels and responds are the dampers. Weak and incorrectly adjusted dampers are responsible for many issues—from notes double-striking to after ring and muting. The subtleties of damper adjustments are paramount to setting up a proper Rhodes.

4. Tine Replacements

At Vintage Vibe we replace a lot of tines! This makes a huge difference in producing an even scale across the Rhodes piano. Replacing questionable tines also makes voicing (our next step) that much easier. All three sections of the Rhodes have trouble spots; in the lower section they often oscillate poorly causing pitch shift or drift, this is inherent in some longer tines. A remedy is utilizing a heavy spring on the back tone bar spring, and if that does not work, replacement is necessary. In the mid section they can lack clarity and the proper ability to vibrate correctly causing a dull tone. Most always replacement is necessary. In the upper treble section, the shortness allows for a lack of sustain. To remedy this, tone bar clips are added to aid in sustain.

5. Voicing

While tuning is a given for any instrument, voicing is where the magic happens. Voicing is where you take your time and articulate each and every note over and over until the desired tone is achieved. Use a Phillips head screwdriver to adjust the front tone bar screw, and you can effectively change the tonality of any given tine adding or removing harmonic and fundamental. A ¼-inch nut driver is used to adjust the pickup volume; by loosening the pickup screw and sliding the bracket toward or away from the tine, you effectively change volume. Together these two adjustments form the bulk of basic voicing. ♫

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